



GERMANY'S NEW AIR FORCE

# MODEL AIRPLANE NEWS

10th Year of Publication

JULY 1938

20¢

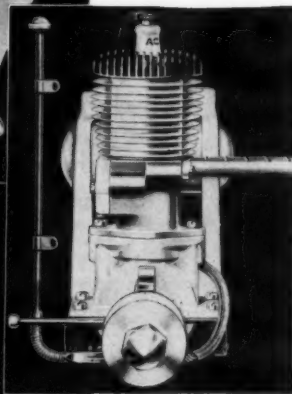
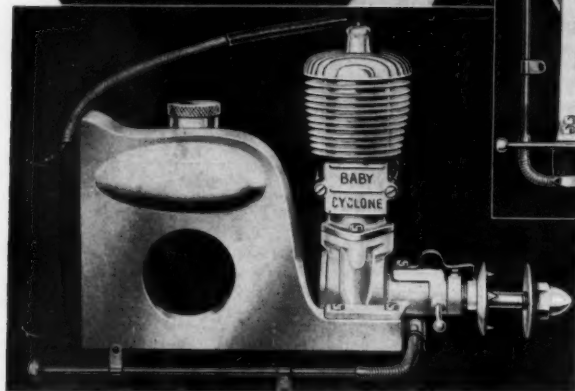
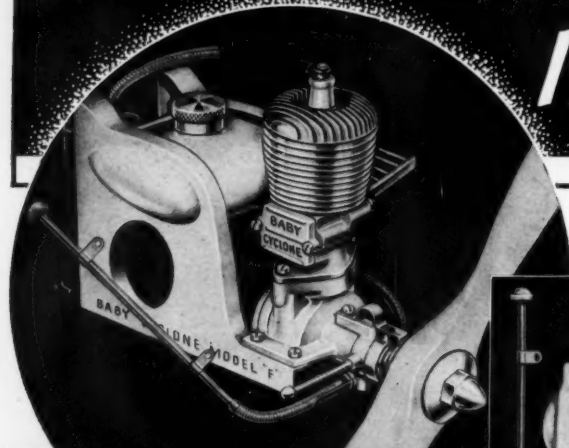


The Boeing "Stratoliner"  
(See Page 31)

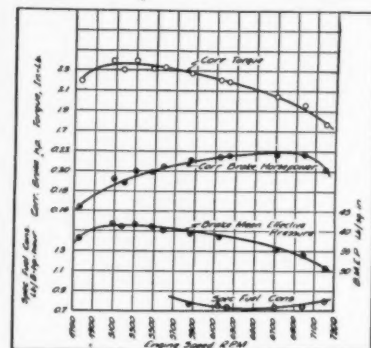
*W. K. K. K.*



# IMPROVED **BABY CYCLONE** 1938 MODEL "F"



## Here Is . . . **PROVEN EFFICIENCY**



This is the actual graph prepared by engineers who gave a standard Baby Cyclone engine laboratory tests. Note especially the high horse power for the amount of fuel used. Full fifth horse power at cruising speed, using only 1.6 lb. fuel per horse power hour. That's why Baby Cyclone wins consistently.

EVERY ENGINE IS BLOCK TESTED BY FACTORY EXPERTS BEFORE DELIVERY

## 1938 BABY CYCLONE MODEL "F" SPECIFICATIONS

**TYPE**, 2 cycle, internal combustion, 3-port rotary valve. **DIMENSIONS**: Width, 1 1/8". Length, including mount, 6 1/8". Height, 4 1/2". **BORE** 12/16"; **STROKE** 13/16"; **HORSE POWER**, 1/5 at 5,500 r.p.m.; **DISPLACEMENT**, 5.84 cc. (1.357 cu. in.)

**CRUISING R.P.M.**, 5,500; **MINIMUM R.P.M.**, 500; **MAXIMUM R.P.M.** (with flywheel), 14,000. **WEIGHT**, Bare Engine, 6 1/2 oz.; Weight Complete, 14 oz., less batteries.

**CONSTRUCTION**: **CYLINDER**, cast iron, with duralumin sleeve shrunk on. Ample cooling fin area. **PISTON**, hardened and ground steel, one-piece. Hand precision lapped in cylinder to .0001" tolerance. **CONNECTING ROD**, die cast, bearings insert at both ends. **CRANKSHAFT**, drop forged, hardened and ground on centers. Special high carbon steel. **ROTARY VALVE**, 3-port, integral with crankshaft. **CRANKCASE**, die cast. Main bearings integral, of finest bearing material known. Used only in Baby Cyclone. **WRIST PIN**, tubular, full floating with duralumin end pads. Hardened and ground. **CRANK PIN**, alloy steel. Hardened and ground. **CYLINDER HEAD FINS**, duralumin. Reduce head temperature 25 to 30 per cent. **EXHAUST MANIFOLD**, die cast and long enough to keep exhaust fumes and oil away from fuselage. **GAS LINE**, Duprene. Not affected by gasoline or oil.

**ENGINE MOUNT**, drawn steel with gas tank integral. Tank holds 2 fluid oz. of fuel and oil mixture. Fits older type Baby Cyclones. **GAS TANK OPENING**, 1/2". Large enough for easy filling in the field. **CARBURETION**, mixing valve type, allowing full control at all speeds by gasoline adjustment only. No air adjustment needed. **REMOTE CONTROL THROTTLE**, can be attached to your model in any position. Fits all previous models.

**IGNITION**, two standard flashlight batteries through coil, condenser and timer to plug. **COIL**, new type with threaded terminals to hold wires securely. **CONDENSER**, .01 mfd., 400 v. capacity. **TIMER**, simple and improved, employing tungsten points. Full advance and retard. **SPARK PLUG**, Champion V, special design for easy starting.

**PROPELLER**, 12 3/4" diameter, 8" pitch.

**BABY CYCLONE PARTS ARE STANDARD AND INTERCHANGEABLE.**

THE BABY CYCLONE CAN BE MOUNTED AS AN INVERTED-TYPE ENGINE. WRITE FOR INSTALLATION DRAWINGS.

## Win Meets . . . **BE A CHAMPION!**

REMEMBER THAT—The famous Baby Cyclone has beaten every engine in the world in competition and is the undisputed World's Champion.

- It can only be purchased direct from the manufacturer (Aircraft Industries) in the U. S. A.
- It has won for others and it will win for you.
- Own the BEST engine in the world and win meets regularly.

**SEND MONEY ORDER TODAY FOR YOUR BABY CYCLONE "F"**



# Special INTRODUCTORY OFFER

FOR THE BEST AND ONLY ENGINE WE BUILD

**BUY BABY CYCLONE -- THE BEST ENGINE IN THE WORLD.** Champion of the United States, England, Germany, France and Belgium

NEW 1938 BABY CYCLONE MODEL "F" ENGINE: COMPLETE AND ASSEMBLED. *Including . . .*

- |   |                             |
|---|-----------------------------|
| 1. COIL.  | 4. REMOTE CONTROL THROTTLE. |
| 2. CONDENSER.                                       | 5. CAN OF LUBRICATING OIL.  |
| 3. DRAWN STEEL ENGINE MOUNT with Integral Gas Tank. | 6. EXHAUST MANIFOLD.        |

*Engine Factory Tested, "Broken In," Ready to Run. Fully Guaranteed Against Defective Materials or Workmanship*

*Price*

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→ **1.50**

TOTAL LIST PRICE, FOR COMBINATION . . . PROPELLER AND 1938 BABY CYCLONE MODEL "F" ENGINE.

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***Less 30% Special Offer***

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BUY DIRECT. WE HAVE NO DEALERS IN THE UNITED STATES**

PRICE IN ALL FOREIGN COUNTRIES \$19.60 FOR DURATION OF THIS OFFER

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☐ BABY CYCLONE MODEL "F".....\$12.50  
(Completely Assembled as Above)

PROPELLER.....1.50

Less 30% Special Offer.....\$14.00

YOUR PRICE.....\$ 9.80

☐ BABY CYCLONE MODEL "F".....\$12.50  
(Completely Assembled as Above)

PROPELLER.....1.50

"CHIEF" KIT.....5.00

Less 30% Special Offer.....\$19.00

YOUR PRICE.....\$13.30

☐ BABY CYCLONE MODEL "F".....\$12.50  
(Completely Assembled as Above)

PROPELLER.....1.50

"CHAMPION" KIT.....7.50

Less 30% Special Offer.....\$21.50

YOUR PRICE.....\$15.05

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# Model AIRPLANE News

10th YEAR OF PUBLICATION

VOL. IX

No. 1

*Edited by Charles Hampson Grant*

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## MODEL AIRPLANE NEWS

- ★ **FUN**—Know about the latest model flyers. Get a real kick from watching *your* ship soar high above, and glide home for a perfect three-point landing.
- ★ **LEARN**—to build racers—cabin planes—big transports—fighters—bombers. Know about wing-stresses—lifting—dihedral—whirlwind motors. Study the gas jobs powered with tiny 1/5 H.P. motors—own your own that will fly 25 minutes.
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For the enclosed \$1.00 please send me:

- ☐ **MODEL AIRPLANE NEWS** for 12 months, also send me, **FREE**, the Taylor Cub Flying Model Kit.
- ☐ **MODEL AIRPLANE NEWS** for 13 months. (No Kit.)

Name.....

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City..... State.....

This offer good in the United States and Canada; offer, excluding kit, also good in U.S. possessions, Cuba, Mexico, Panama and South America.



# The NEW AIRSTREAM DENNYMITE

DE LUXE...\$17.85  
STANDARD \$15.85  
UNIT.....\$13.85

**Exclusive streamlined design...  
the smoothest engine ever built...  
a thriller inside and out!!!**

## A Streamlined Sweetheart!

A sweetheart to look at on the ground, but a bundle of snarling, driving fury in the air! Whether you want an engine for smooth, aristocratic looks—or one built full of ever-lasting energy from the shaft both ways—you're sure to want this streamlined dynamite.

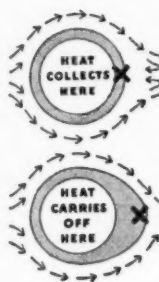
Just look how smooth and trim she is—as sweet as any ship she'll power. Cadmium plated, too—to look her best now and a year from now. The tear-drop shape's every bit as practical as it is smart! It brings to model engines greatly advanced engineering principles and performance.

A lot of other proven engineering superiorities are Denny's too—look at right for proof that she's as sweet inside as out.



**WALTER RIGHTER**

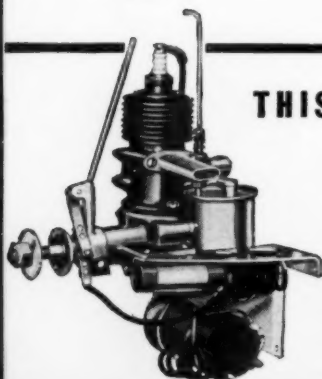
*Graduate of Cal-Tech;  
Member of S.A.E. says:*



**WRONG**—Semi-vacuum behind round cylinders causes blistering heat pocket at back. Uneven cooling causes distortion, wear, and loss of power.

**RIGHT**—See how airstream cooling protects your engine. Fins are scientifically proportioned for even radiation. You get better looks, sweeter running, and more power!

*"I have rigidly checked the specifications and construction of the new Airstream Dennykite, and have repeatedly tested its performance as it leaves the assembly line. I hereby certify that it will meet or exceed all claims made for it by Reginald Denny Industries. I FIND IT DEFINITELY SUPERIOR TO ANY SIMILAR ENGINE ON THE MARKET."*



**THIS SPECIAL BUY \$14.50**

Here's a chance to save \$3.35 and still have a genuine, success-tested DENNYMITE powerplant: our standard round cylinder head engine at this new low price. Repeatedly proved vastly superior to others of its type in performance, long life, easy starting. Tremendously powerful, oversize bearings, many deluxe features; without streamlined outside exhaust stack and new spring choke. An engine insuring years of satisfaction, and an outstanding buy at this price. Packed complete, ready to fly, with dural mounts. Factory tested, adjusted and guaranteed.



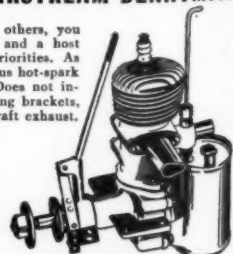
## DE LUXE AIRSTREAM DENNYMITE

The best you can buy and the most for your money! Standard on the De Luxe Airstream (above) are aluminum outside exhaust, dural mounts for fire-wall, bakelite-cased superior coil, and outside-control choke. Saves \$2 over buying these DeLux "extras" separate.

**\$17.85**

## STANDARD AIRSTREAM DENNYMITE

For less money than others, you get full streamlining and a host of other Denny superiorities. As illustrated at right, plus hot-spark coil and condenser. Does not include DeLux mounting brackets, spring choke, down-draft exhaust.



**\$15.85**

## AIRSTREAM ENGINE UNIT ONLY

(Less coil and condenser)  
There are no "seconds" in the Denny line! This economy purchase is identical to the higher priced standard model except that condenser and coil are not included. Especially planned for replacement installation to avoid wasteful duplication of parts.

**\$13.85**

*Every Dennykite is tested to full power and perfectly adjusted, ready to bolt to your plane and fly away.*



# Here are Facts! ...not unsupported claims...facts that spell the difference between the mediocre success you might get with some engines and the superior performance you do get with the new Airstream Dennymite

You may be building a plane to win championships. Or you may only want the thrill of watching your own-built plane roar into the air. Whatever your plans, you want an engine that gives you these things above all else: **Power, Long Life, and Sure Starting.**

## Built for Longer Life

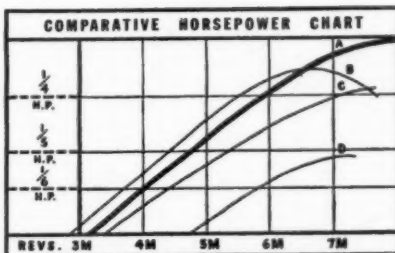
Your new Airstream Dennymite is made to last! Vibration is reduced by the use of bearings 16.6% bigger than any other engine of its size on the market. Wear is reduced by the use of molybdenum iron piston and cylinder, which carry a much stronger oil film than steel parts and remove all need for troublesome rings. The Denny timer is so rugged that we'll replace it free if it ever wears out.

## More Power at Flying Speeds

Denny makes no unsupported claims but gives you power to spare (see power curve at right). Generalized factory claims don't produce power to meet all operating conditions! That kind of performance comes from vital features such as the new Dennymite's 1-piece high compression cylinder, its perfect fitting microlapped piston, its scientifically counter-balanced crankshaft, its oversize bearings!

## Ready to Install—Ready to Run

Every single Dennymite is thoroughly tested and "run-in" before it leaves the factory. It comes



to you in perfect adjustment—ready to run, and run right. Fewer, simpler, better parts make it easier to keep in top condition—contribute to the fun you'll have.

## Make This Test Yourself

Be sure you get all three fundamentals when you buy—**Power, Long Life, Sure Starting.** Don't be satisfied with  $\frac{1}{2}$  or  $\frac{2}{3}$  of an engine! Make this sure, simple test yourself.

## NOTE 'A' PROOF OF DENNY POWER SUPERIORITY

See for yourself how greatly superior the Airstream is in every respect. You can see its greater beauty and its superior engineering features, but you can't see its superior power. Impartial, accurate machines in a mechanical laboratory have tested this all-important factor for you. Their unbiased report is shown on chart at left. See how the Airstream leads in power as in all other factors. Every competing engine tested is considered a "leader"—all are much higher priced than the Airstream. (Engine B is much larger in size.) Note especially tremendous superiority at high speeds—the EXTRA margin of power that wins contests!

Go to your dealer and examine the three leading makes. Compare the Airstream with the best for power, compare it with the best for long life, compare it with the best for sure, easy starting. Rate each engine according to your own findings and know beyond all doubt how superior the Airstream really is on all counts. Consider, too, the great added advantage of airstreaming. Last, but not least, compare the price. Denny gives you much more, for much less.

## LONG LIFE

**CYLINDER & PISTON**—Both molybdenum iron—minimizes friction—oil film 30% stronger than steel.

**BEARINGS**—World's largest for size of motor.

**CRANKCASE**—Practically indestructible, special aluminum alloy—withstands 2100 lbs. breaking test.

**TIMER**—Surest! Free replacement if one ever fails.

## POWER

**CYLINDER**—1 piece—no loss of compression. Runs 30% cooler.

**PISTON**—Micro-lapped to perfect fit—no piston rings to break.

**CRANKSHAFT**—Scientific counterbalancing and oversize bearings reduce vibration 12%.

## EASY STARTING

**CARBURETOR**—Exclusive mixing valve for perfect vaporization at all speeds. Spring choke controlled from outside the cowl.

**IGNITION**—New improved vibration-proof Denny system with Champion Sparkplug.

## NOTICE TO DEALERS:

Make more money by giving more customers more for their money! Denny discounts provide ample margin, dominant Denny advertising directs buyers to your store. Airmail your order today or wire for wholesale prices.

## MONEY-BACK GUARANTEE!

Inspect your Airstream engine at our risk when you get it. If for any reason it is not up to your expectations, you may return it for 100% refund. Simply return it prepaid within two days to the place you bought it and get your money back without question. Any abuse or scratching of the engine naturally voids this offer.

**IF NECESSARY — ORDER BY MAIL —**  
 Reginald Denny Industries, 3751 Hollywood Blvd., Hollywood, Cal.  
 Enclosed find cash (at my own risk) or money order for the prepaid price of the Dennymite model checked below: I can return it unharmed within 2 days if I don't like it.  
 Standard Airstream . . . \$15.85  
 Complete (Round Head) . . . \$14.50  
 Deluxe Airstream . . . \$17.85  
 Airstream Engine Unit only \$13.85  
 Name \_\_\_\_\_ Address \_\_\_\_\_ City \_\_\_\_\_  
 California customers only please include 3% State Sales Tax.





The Arado AR-99 trainer has fighter lines but is powered only with a 100 hp. Argus motor. (McRae)

THE Versailles Treaty stipulated, among other things, that Germany should build no more military aircraft and with the ink drying on the signatures of the German delegates, the Allies' representatives relaxed and set back. No more need they fear the

## Germany Builds an Air Force

By E. J. BULBAN



A 240 hp. Arado AR-76 single place pursuit trainer power-dives. (Arado)

sound of enemy bombers in the night preparing to blast them into eternity, no more "Bloody Aprils" with five of their planes downed to the enemy's one. It was all gone now, guaranteed by treaty. But, who was it remarked that treaties are made to be broken?

And now, so soon, their thin bubble was burst. In several thundering public addresses Reichsfuehrer Hitler revealed that Germany had long abandoned their comforting treaty, that a highly efficient military machine was being developed with particular regard to aviation. Though figures are almost impossible to obtain, there are approximately from 2000 to 2800 first line types seeing service, with at least 100 per cent reserves. And the well-known German efficiency is evident everywhere.

Most of the factories are turning out planes by mass production methods, similar to those employed by the automobile indus-

try in the United States. And even the factories are being constructed to meet wartime conditions. Over there the plants are arranged so that the buildings do not lie in a straight line but are carefully scattered over the grounds. This prevents an enemy raider from strafing a whole row of buildings in one dive, and also protects the surrounding structures from damage, should one be set on fire. In the United States any attackers, if they could get near enough, would be able to put a whole factory out of commission by loosing several incendiary bombs on the building, since we put all of our production work under one roof. The workers are also well protected by having bombproof and gasproof shelters to "hole up in" during air attacks. The companies figure that it is easier to replace a factory than skilled men. Though the scattered buildings hamper speedy output, this problem is met by employing more men.

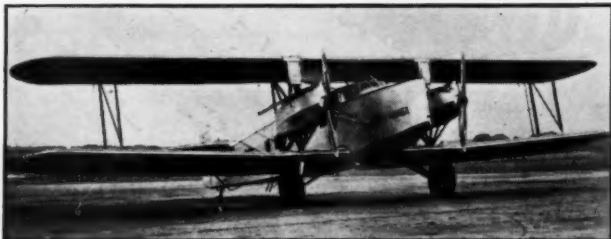
Though the Germans at first used converted civil aircraft modified to meet military requirements, they now have in production and service first-rate machines in every class, fitted with engines capable of delivering at least 1,000 horse-



Latest Ju. 86, 1400 hp. twin engine bombers. Note gun turrets.



The 240 hp. Argus powered Focke-Wulf Fu-56 Stosser, single place pursuit trainer. (Courtesy-Focke-Wulf)



An old type twin engine bomber, Albatros L-73. (Joe Nieto)



Parade of the "Horst Wessel" flying squadron. (Globe)





The Arado AR-77 bomber, powered with two 480 hp. motors. (Courtesy of Arado)

## How the Germans Have Developed a Super Military Air Force in Spite of the Handicaps Imposed Upon Them by the Versailles Treaty

power. The outstanding engines now in production are the Daimler-Benz in the high power class, and the Argus types for trainers and home defense machines. In the experimental stages are the Diesel oil-burning types being produced by Junkers. Present plans for these call for a horsepower rating ranging from 1,500 to 2,000 hp. with a specific weight of 1.1 pound per horsepower!

Among the first types to be supplied to bombing squadrons, after being suitably fitted, was the Junkers Ju. 52 powered by three B.M.W. "Hornets", a very stable, though slow machine and well suited for its duties. However the government is quickly replacing the Ju. 52's with speedier, more up-to-date Ju. 86's. The Ju. 86 is powered by Two Junkers "Jumo 205" Diesel engines of 700 h.p. each. The entire structure is metal; the fuselage consisting of metal bulkheads and stiffeners, with metal-sheet covering employing flush riveting.

The center section, holding the motors, is integral with the fuselage. The outer wings are made up of three metal girders covered with smooth metal sheets. Landing flaps extend the whole length of the trailing edge, the outer portions also being used as ailerons. The tail is of monoplane design with twin rudders. The rudders and fins are all-metal, cantilever affairs, fitted with controllable trimming tabs.

The landing gear is electrically retract-

able, fitting oil pressure shock struts. The Ju. 86 has a span of 73 feet, 10 inches; length 57 feet, 5 inches; height 15 feet, 8 inches. The maximum speed varies with load but normally it reaches 235 m.p.h. A specially fitted Ju. 86 has completed flights of 3,700 miles non-stop, showing well this craft's possibilities, and at the same time a good argument for the Diesels fitted to it.

In 1924 the famous wartime firm of Albatros was taken over by Focke-Wulf, a concern noted for its high performance trainers. When the newly formed air force started training they did so on the Focke-Wulf Fw. 44 "Stieglitz", which became their standard primary trainer. Some of you may remember Gerd Achgelis' masterful flying with this ship at previous National



A sleek lined Heinkel pursuit with a 650 hp. B.M.W. engine. (Heinkel photo)



The Focke Wulf F.W.58-B four place bomber-trainer.



Gotha G.O. 145, 132 m.p.h. two place advance trainer.

Air Races. The "Stieglitz" is of conventional biplane construction. The fuselage is of welded steel tubing, fabric covered, and wooden wings also covered with fabric. The power plant is a Siemens Sh 14 A of 150 hp.

(Continued on page 50)

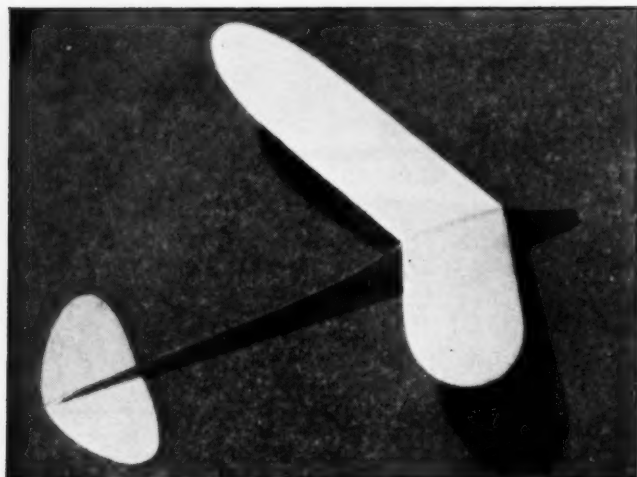


Dornier Do-22, reconnaissance, torpedo seaplane.

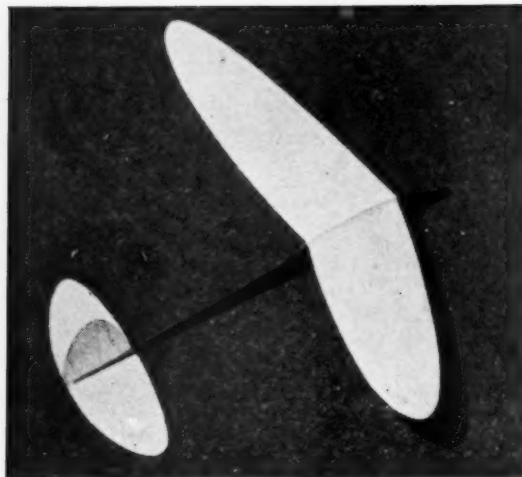


Dornier Do-18, convertible long distance patrol plane.





This straight wing glider gives slightly longer duration.



The finished tapered wing glider

## Two Winners For Low Ceilings

By WILBUR TYLER

Here Are "Heavenly Twins" That Are Easily Made and Which Will Enable You to Win Contests

**REMEMBER** our recent tirade agin' flying high ceiling indoor models in low ceiling armories?

Seems that even the experts make that mistake once in awhile; so to aid indoor fliers, *MODEL AIRPLANE NEWS* presented a stick model as the first in a series of championship craft specially designed for low ceiling competition.

Here's another winner!

Or rather, two. These two class A indoor gliders (less than 30 square inches in wing area) have broken Jordan Marsh Junior Aviation League Boston records again and again. In an armory with an effective flying height of only 40 feet, these gliders hold an all-time high record of 40.5 seconds. That's a sinking speed of less than one foot per second—good in any man's league and the best ever done in New England.

These gliders were built and flown to new endurance marks by Gordon Cain of Boston. Instrumental in perfecting the design were Beantown's Bob Shea, Bruno Marchi and the author. Cain, the record holder, is an up and coming young Leaguer and was one of the point system leaders for the 1937-38 flying season. These gliders enabled Cain to win many indoor contests.

While they embody advanced construction, the less experienced builder can obtain creditable results if care is taken in the construction of them.

Both winning gliders are presented here. The straight wing with sweepback has flown a fraction of a second longer than the glider with the lower aspect ratio. But both would be evenly matched in most any meet.

Construction of both gliders is the same.

The wings are cut to outline shape from a sheet of firm 1/16 inch balsa. Each wing half is sanded to the airfoil shape shown in the plans and the under camber is produced by bending the panels while breathing on them. Glued into the leading edge is a 1/64 inch square bamboo strip, which acts as a

bumper should the glider hit a girder while in flight.

The two wing panels are cemented together at the proper dihedral angle. While these are drying, cut the fuselage to outline shape from a medium hard sheet of 3/32 inch balsa. Round off all corners and apply several coats of dope to fill the wood pores and strengthen the fuselage. Sand lightly between coats.

Cover the fuselage with tissue paper, except at the sections where the wing and tail surfaces are to be glued to the body. This step will add strength to the body as well as reduce drag. Apply several coats of dope to the paper, smoothing it down with fine sandpaper or jeweler's paper.

From a quarter-grained sheet of medium hard 1/32 inch balsa cut the stabilizer and rudder and sand to streamline shape. Then coat with dope to which has been added several drops of castor oil. The oil acts as a plasticizer and prevents warping. Apply several coats of this dope and castor oil mixture, sanding between coats.

Cement the wings to the fuselage at zero angle. Don't forget the adage: Spare the glue and spoil the glider! Use an ample amount of cement and spread a half-inch skin of glue on each wing panel at the center on top and bottom as illustrated in the drawing.

As the final assembly step, cement the rudder to the top and the stabilizer to the bottom of the glider body—both at zero degree angle. Check the alignment carefully while the glue is drying. It is advisable to prop up the wing with blocks during this period to insure accurate alignment.

While assembly joints are drying mix some clear dope with talcum powder until the concoction has the viscosity of heavy molasses. After the cement on glider joints is thoroughly dry, apply a coat of the dope-talcum powder mixture to the wings and tail surfaces and sand smooth. Do this

three times—don't weaken and the surfaces of your glider will be smoother'n glass.

A note of caution: do not apply the dope-talcum powder mixture before assembly or glue will not adhere to the cementing surfaces.

### A Bit About Adjustment

This indoor glider is adjusted like any similar type. Immediately apparent is its slow flying speed. A right-handed contestant bends the rudder slightly for a left circle and increases the lift of the left wing by giving it "wash in," which is bending down the trailing edge of the left wing near the tip. A left-handed modeler will bend his rudder to the right and give the right wing "wash in."

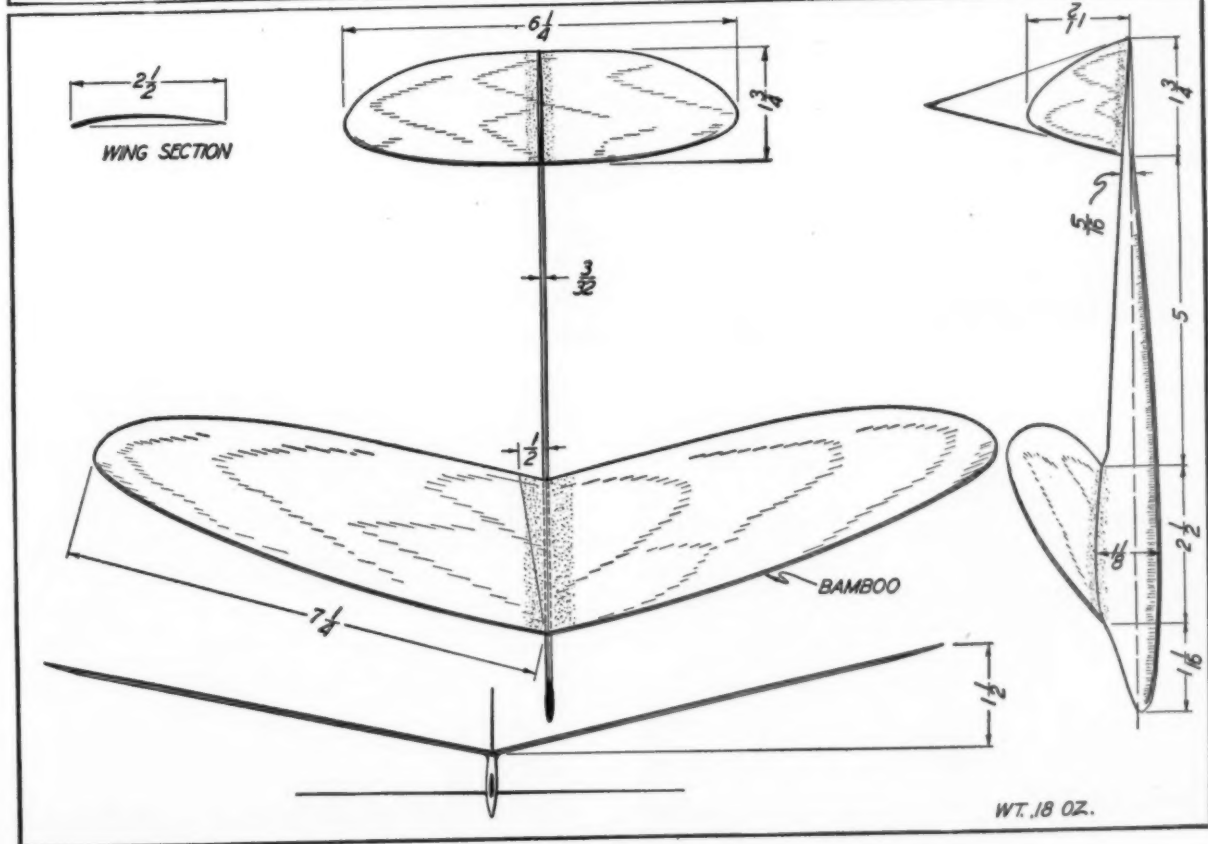
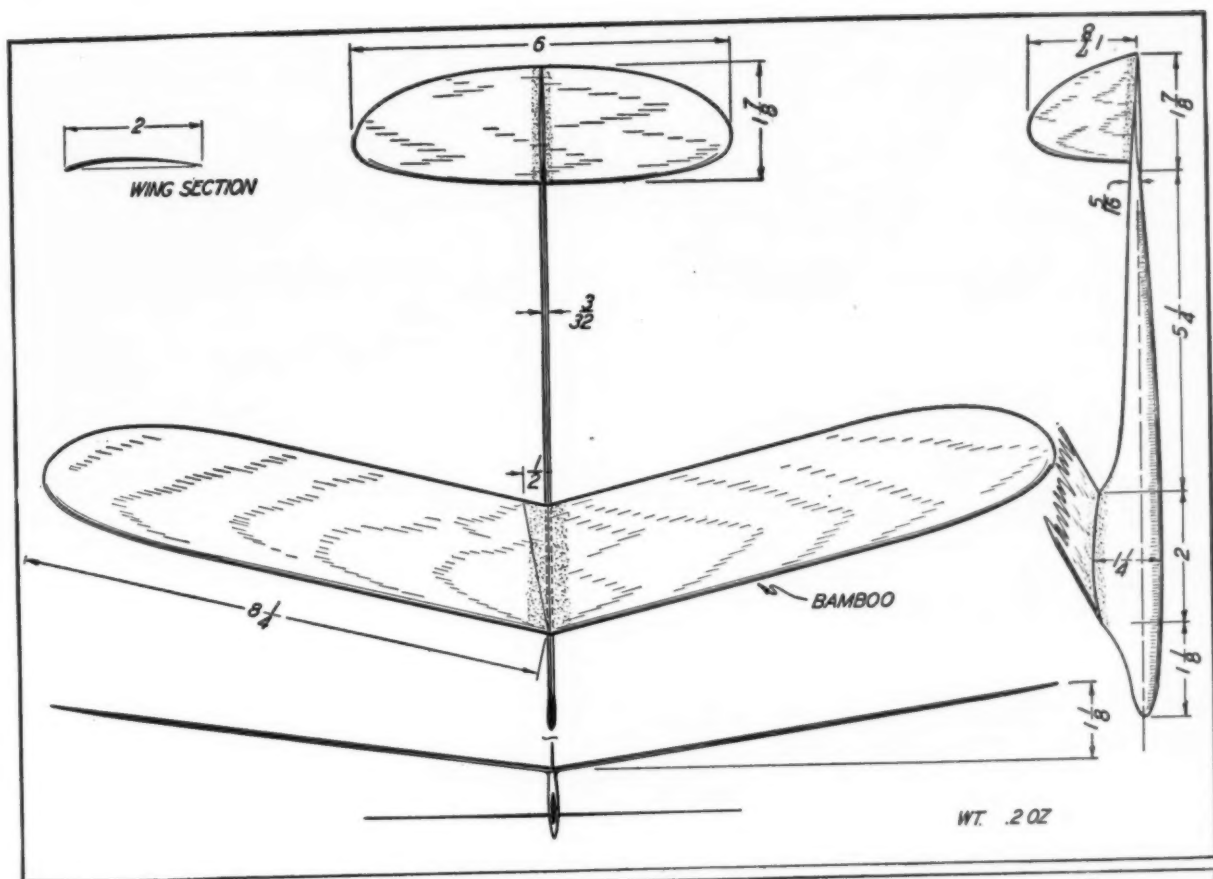
The glider may be launched in a side roll or vertical climb. With the latter, the glider should spectacularly flip out of the climb at its peak.

A correctly constructed glider is good for about one second of flight time for every foot of effective indoor flying height up to 40 or 45 feet. Above 45 feet a glider is out of the low ceiling class and requires heavier wing construction.

### AVIATION INSTRUCTORS

We call your attention to the great value of these little high-performance ships in class work. They are simple to build and are therefore within the scope of the novice to complete successfully. Yet, they provide a means for the beginner to enter and win contests against more experienced fliers.









The Boeing Super-Fortress mothers the "Baby Seversky."

The "Giant" dwarfs the Seversky pursuit resting under its wing.

# The Army's Flying Dreadnaught

By DOUGLAS J. INGELLS

Pictures by courtesy of the U.S. Army

NOT long ago the War Department in Washington got the idea it wanted a superplane for America's Air Armada. Today that plane has come into existence. It is the Boeing B-15 Bomber now undergoing acceptance tests at the army's experimental laboratory at Wright Field in Dayton, Ohio. Considered the largest bomber on earth, this ship is America's bid for supremacy in the air.

It is approximately ninety feet long, eighteen feet in height and its wing spread one hundred and fifty feet. Except for its mammoth size it greatly resembles the army's "Flying Fortresses" which recently completed the longest mass flight of land planes in history, when six of them flew from Langley Field, Virginia, to Buenos Aires, South America; a distance of six thousand miles.

Four 1000-horsepower twin-row Pratt and Whitney "Wasp" Senior engines supply its power. In addition there are two auxiliary engines located inside the plane, driving the generators in a 110-volt, alternating current electrical system that involves approximately seven miles of wiring. This is a new development for modern aviation. Formerly the current for electrically operated devices in airplanes was supplied through a low voltage battery direct current system.

(Continued on page 55)

Maj. S. M. Umstead, the test pilot.

Left: The huge landing gear.

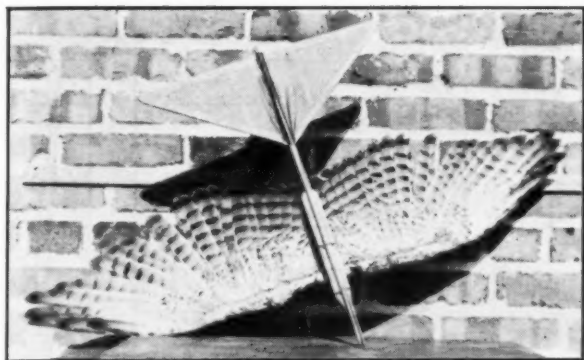


Nine men on the right constitute the crew.

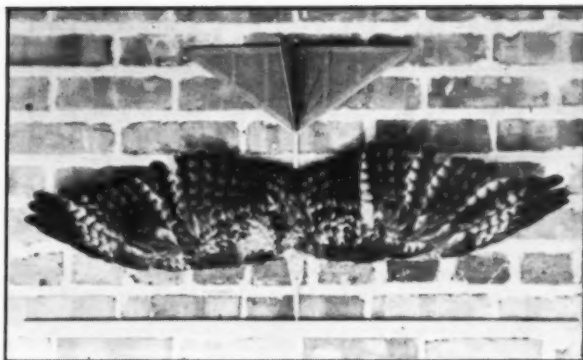


The machine gun turrets are conspicuous.





Underside view of hawk wings on a glider.



Looking at the hawk-wing glider from above.

## Can Gliders Soar With Bird Wings?

**D**URING the past six months the writer has made a rather serious study of soaring flight, as performed by models and birds. The experiments and observations have been in the nature of a "check up" of similar experiences scattered over the past thirty years, and inspired originally by Octave Chanute, who pioneered the subject.

The development of motor driven airplanes has resulted in airfoil sections differing greatly from bird wing profiles and well adapted to high speed requirements. Consideration of stability has resulted in elongation of the body of airplanes as compared to birds, so that the flying machine of today presents a considerable divergence from nature's models.

During some recent experiments with conventional sailplane models leading up to a full scale project it occurred to the writer that it might be interesting and instructive to make a direct and deliberate approach without prejudice to the design of nature. The idea was to build some models based on the information obtained and to actually fly them in comparison

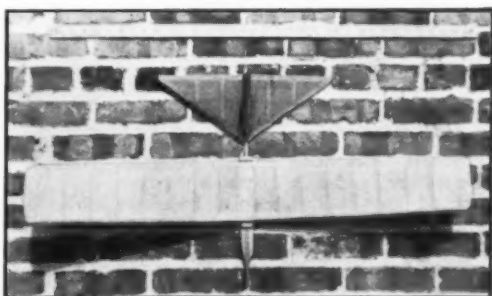
### Comparative Results of Experiments With Common Gliders and Gliders Equipped With Bird Wings

By L. J. LESH

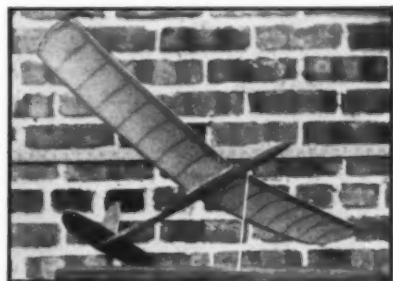
with the more synthetic products of the wind tunnel and the slide rule.

The first step was to obtain a pair of bird wings, make careful measurements and then test the wings in gliding flight with an artificial body and tail. A hawk was brought down in fair condition and weighed. The scales showed a total weight of 1 pound, 11 ounces, while the weight of the wings and tail which should be included as part of the supporting surface was about four ounces. The total effective lifting surface measured about two square feet, and granting the ability of the hawk to carry a load of five ounces, the wing loading may be estimated at one pound per square foot, which is somewhat higher than anticipated.

The drawing of the hawk wing shows exact wing sections unloaded. These sections would be somewhat flatter due to the flexibility of the feathers resulting



The same glider with built-up wings.



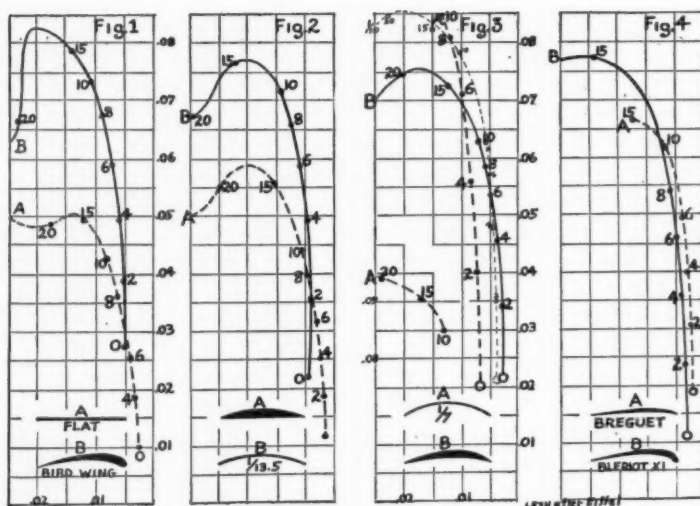
A refined glider that has excellent soaring qualities.

in a reflex curvature of the trailing edge, dependent on the load carried. The wings were first mounted on a body for flight test by cementing two 3/16" dowels in position between the two bones which form the supporting beams of each wing. This was not entirely satisfactory and



The Boeing B-15, America's largest air dreadnaught; sleek, graceful, powerful and deadly.





was replaced by a balsa beam for each wing, the bones being entirely removed. The feathers and skin to which they are attached are easily stripped from the bones and may be cemented to balsa spars of oval section suitably tapered to a flat section at the end of the spar which will come at about the middle of the wing. The tip feathers radiate from this point and we found it necessary to support these feathers by a 1/32 inch thick semi-circular disk of celluloid, cemented to the spar, and sewed and cemented to the base of the wing tip feather quills.

The wing spars were carefully mounted

on a streamlined block about three inches long and made flat on the bottom so that it could be mounted on a body stick with rubber bands and adjusted in position on the stick for proper balance. A tapered block between the wing block and body stick permitted change in the angle of incidence of the wings. A number of body sticks used with model sailplane wings were available for test, providing various types of tail surface and body length.

Several experimenters in the past have reported results with actual bird wings in glider flight—generally favorable. Personal experience is that such wings are extremely tricky to adjust but that if everything is exactly right good glides may be accomplished. Due to the deep camber of the wings and the fact that the center of gravity of the wings is very close to the leading edge, the bird wing is constantly attempting a nose dive. Negative incidence of the stabilizer does not seem to hold the nose up and the experimenter finally winds up with the load placed well behind the center of figure of the wing. Attempts to tow the glider with a string were a distinct failure; very rarely resulting in a flat glide. The conclusion reached was that the bird wing,

as demonstrated in nature, is actually capable of flat glides supporting a lot of weight but with very critical stability. The flying technique employed with success in our built-up wings of balsa and tissue was totally inadequate.

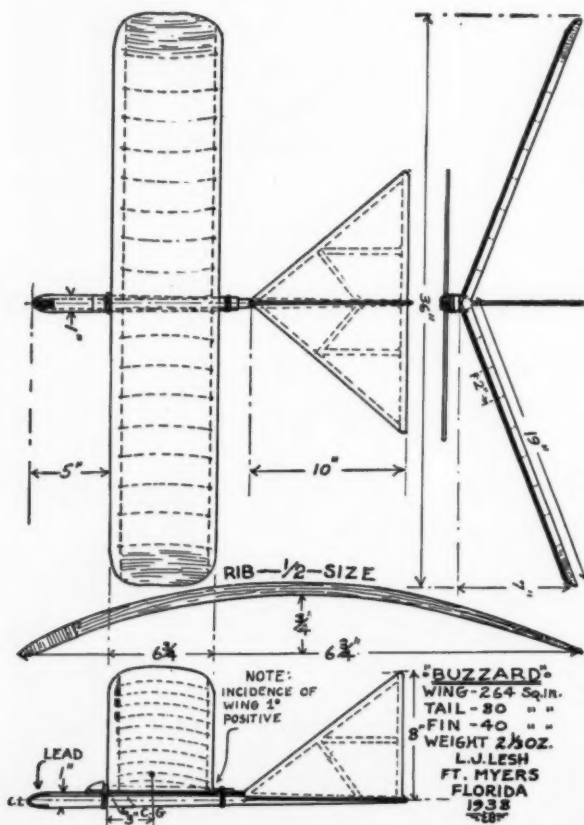
For the benefit of those realists who care to make a rather exact copy of a soaring bird wing in balsa and tissue, the hawk wing drawing is laid out with these materials in view, while the actual position and direction of the feathers of the wing is indicated by dotted lines.

The main distinction of the bird wing as compared to other airfoils is its concave section. The study "boiled down" to this feature and means for applying bird wing sections to models which would really fly.

We have prepared a chart, largely from wind tunnel tests by Eiffel, showing what may be expected of bird wing sections and comparing these profiles with others. These curves show lift and drag coefficients at low flying speeds and for various angles of incidence marked along the curves. The height of the curve at any particular point shows the relative lift and the distance of this point from the right hand edge of the chart gives the drag or resistance.

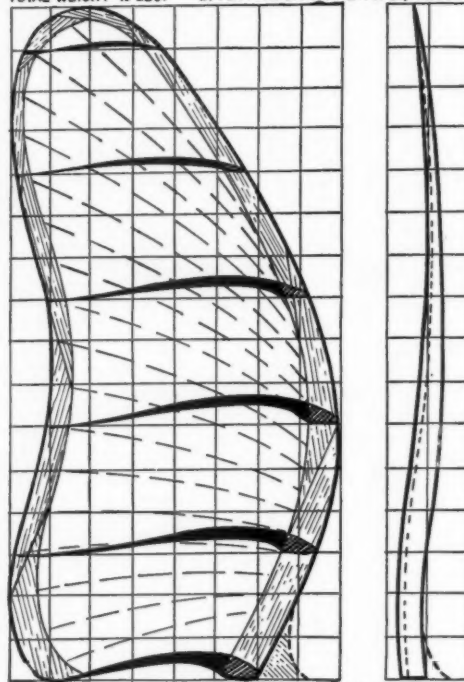
Fig. 1 compares a flat wing with a bird wing, but Eiffel neglects to identify the bird which we will presume to be a soaring bird. Fig. 2 compares a thin wing of curvature one inch to chord of 13.5 inches, with the same wing filled in to present a flat surface on the underside. Fig. 3 compares a very concave wing (1/7) with a crescent shaped wing, which the writer found to be very good for soaring models.

(Continued on page 47)



## HAWK

TOTAL WEIGHT 2 LBS. EFFECTIVE LIFT AREA 2 SQ. FEET



RED SHOULDER HAWK WING, SCALE 1/4, WT. 45 grams  
L.J. LESH, DEC. 22, 1937 Area 95 sq. in.



# How to Build a Pursuit Type Gas Model

Here Is a Small Snappy Gas Job That Looks Exactly Like a Miniature U.S. Army Plane and Which Performs Well

By PETER WESTBURG

THE WS-3 gas model was designed primarily for appearance, although its flying qualities are remarkable in view of the fact that it is quite small and comparatively heavy for its size. The original model weighed almost  $4\frac{1}{2}$  pounds, with a wing area of 600 square inches. The wing loading was well over one lb. per square foot. However, by careful work, the weight could be brought down to under four lbs.

This model is copied somewhat from the Douglas O-43 and makes a really beautiful model when finished in regulation army colors.

An inverted Baby Cyclone engine equipped with an adjustable timer is used. Other engines could be used with minor changes in construction. It is believed a 1/5 hp. engine would greatly improve the performance of this plane and if any of you readers build this plane and use a 1/5 hp. engine, the author will appreciate hearing from you regarding its performance.

You should have very little trouble in making this plane because nothing on it is very complicated. A careful study of the plans will tell you everything you want to know.

Since the tail surfaces are easiest to make, suppose we start with them. They are made in two halves for adjustability and ease in transporting. By simply loosening the turnbuckles, the angle of incidence can be varied within a range of five degrees. The tail wires are No. 24 soft tinned wire.

Lay out the bottom ribs which are  $\frac{3}{16}$ " x  $\frac{1}{8}$ ", and over these lay the two  $\frac{1}{4}$ " square hardwood spars. The  $\frac{3}{8}$ " wide outlines are glued on and then the top ribs. Put in the triangular braces. Bind the pieces of  $\frac{3}{32}$ " rod and wire the fittings. The butt rib must be filled in so it is solid. When thoroughly dry, trim off the outlines to make a neat, streamline appearance.

The wings should come next. The airfoil section used is the old standby, the Clark Y. Lack of space prohibits drawing all the ribs and so we have presented only three ribs to show you how they are made. Rib No. 14 is  $\frac{1}{4}$ " thick, rib No. 9 is  $\frac{1}{8}$ " thick, all others are  $\frac{1}{16}$ ".

Do not make the spars until after you have cut all the ribs. The spars vary in height and the top surface of the rear one is beveled. They are solid and half-inch wide.

After binding on the tubing, assemble the ribs on the spars and then glue on the half-inch outlines. You should have no trouble with the trimming tab. Only one is necessary and that is on the left wing panel. Either tin, copper or brass strip hinges can be used. The bottom of the wing between the leading edge and the front spar, and the rear spar and the trailing edge is covered with  $\frac{1}{32}$ " balsa. The rear sur-

Assemble the sides on bulkheads No. 3 and 4. No. 1 and 2 are next put in, then 7. Put in the cross-pieces and formers. At this stage the hickory engine mounts, which are  $\frac{3}{8}$ " x  $\frac{1}{2}$ ", can be installed.

The landing gear legs, which are also hickory, must be notched and fitted together carefully before putting in. The  $\frac{1}{4}$ " thick sides of the box are glued in first and the holes for the upper ends of the landing gear legs cut in. Glue the legs in very well at all points and finish by putting in the top and bottom of the box.

The tail blocks are made out of soft or medium balsa. Hollow them out as much as possible and fit the top one on carefully. The bottom one is not put on until the rudder is done. Pieces (x) are glued on next. Square them up accurately and use plastic wood to make a fillet. Drill in the  $\frac{1}{8}$ " front hole for the tubing that acts as socket for the stabilizer pins. The tubing in the rear groove moves freely up and down.

Assemble the ribs and outlines of the rudder on the  $\frac{1}{4}$ " square rudder post and insert it carefully in the tail block. Glue well on the inside. The trimmings tab is solid and the same kind of tin, or other metal, hinges are used. The top and bottom tail wire fittings are

put on and wired securely.

The battery box can be made of  $\frac{1}{8}$ " flat hard balsa or cigar box wood. Use small brads and plenty of glue. Only one tab is necessary and a  $\frac{3}{8}$ " wood screw is used. Piece (Y) is a  $\frac{1}{4}$ " x 1" x 10" piece of hard balsa and serves only as a runner for the battery box. Mount the switch in its proper place in the cockpit.

You should have no trouble in the construction of the gull. Its construction is quite clearly shown. Take great pains in putting on the butt ribs. Note that the angle of dihedral, which is four degrees, is built into the gull, not the wing. The angle of incidence is two degrees and must be carefully built in. Line up the tubing accurately and bind well. The dashboard, the flat piece between it and the rear spar come next; and then the trailing and leading edges. At this point you can put in the ignition system. The condenser is fastened to an engine mount with a clip; the

(Continued on page 49)



Here is the little ship ready to fly. Looks like a real full size plane, doesn't it?



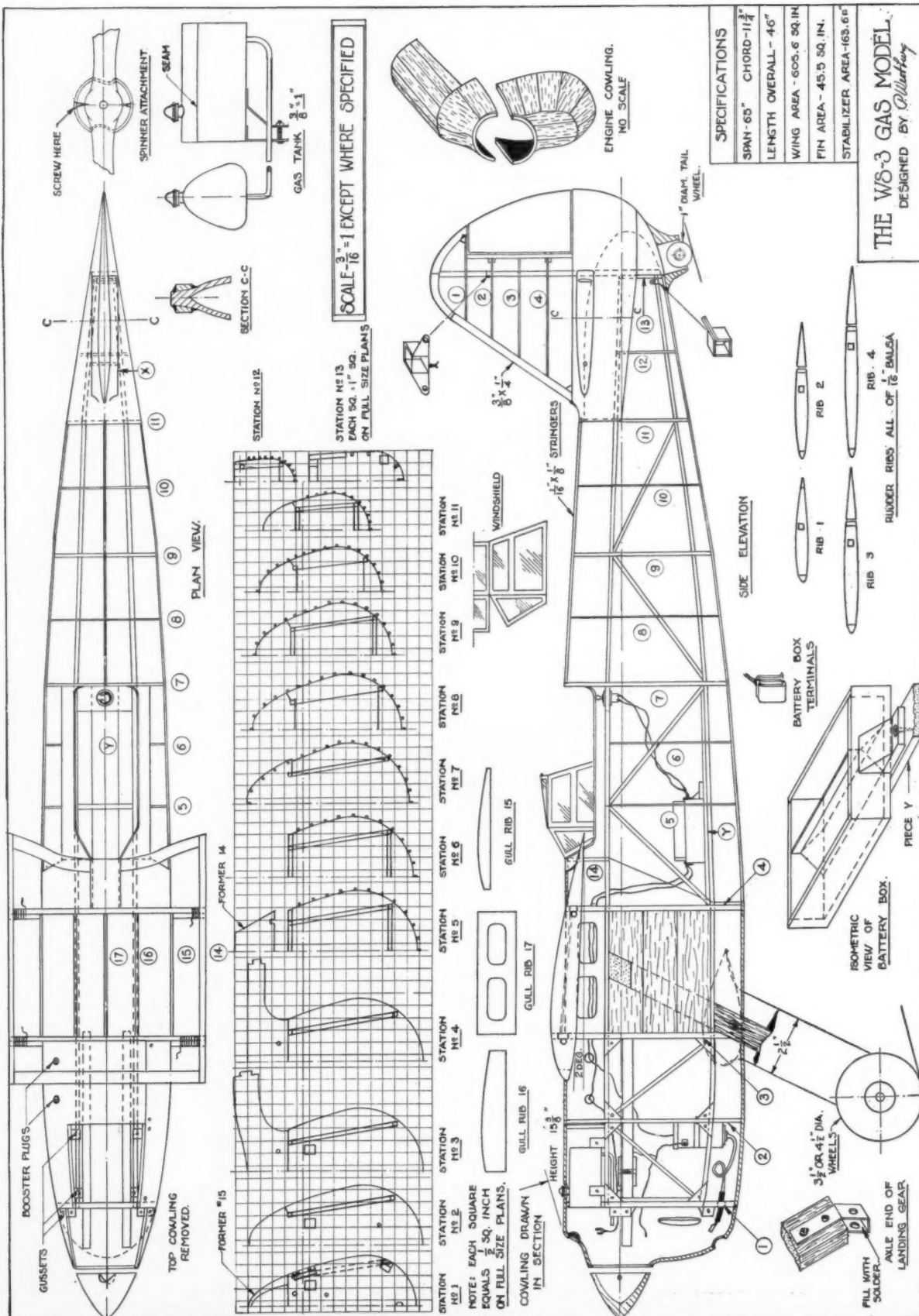
A view from the rear. Note the detail of the cockpit and the insignia which creates a realistic effect.

face is covered diagonally and  $\frac{1}{64}$ " x  $\frac{1}{4}$ " strips are glued on to cover the tracks and make a better appearance. This strengthens the wing and no internal bracing is necessary. It also makes the wing virtually warp-proof. The tin wing fittings have a  $\frac{3}{8}$ " piece of either brass or aluminum  $\frac{1}{8}$ " O.D. tubing soldered to them and bolted and glued to the spars just outside of rib No. 9. Trim the edges of the wing and you have finished it.

Now for the fuselage. Don't be dismayed. It looks a bit complicated but as you progress you will discover how simple it really is.

The longerons, crosspieces, diagonals and uprights are all  $\frac{3}{16}$ " square. After you have laid out the sides, make the bulkheads. Be sure all the holes are cut or drilled in. No. 1 is  $\frac{1}{4}$ " thick veneer, 2, 3 and 4 are  $\frac{1}{4}$ " thick hard balsa and 7 is  $\frac{1}{8}$ " thick. Formers No. 5, 9, 11, 13, and dashboard 14 are all  $\frac{1}{8}$ " thick. The intermediate formers No. 6, 8, 10, and 12 are all  $\frac{1}{16}$ " thick.

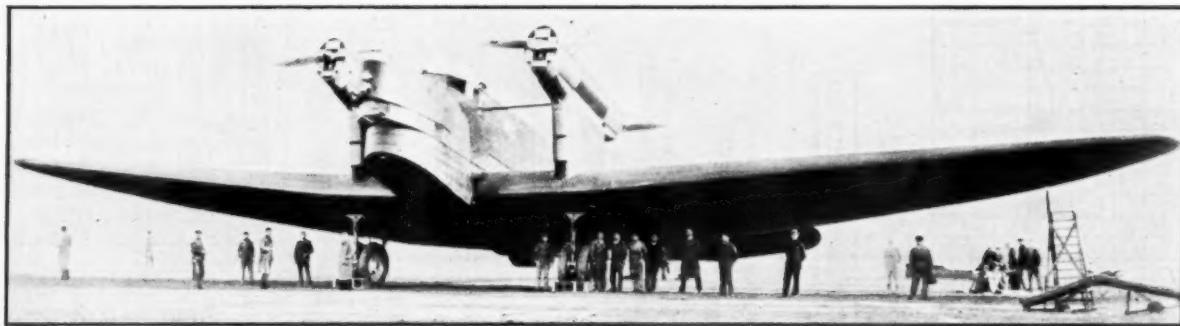












A mammoth French bombardment plane, the Potez 41, which carries a load of 15 tons with four 500 hp. engines. (Nieto)

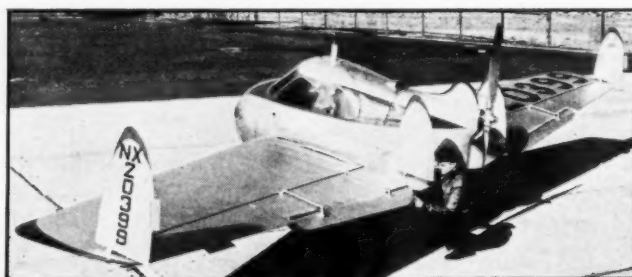
## Frontiers of Aviation

Details of the Startling Developments of New Bombers, Pursuit Planes and Ocean Transports  
—How to Build a Scale Model of the Aeronca K

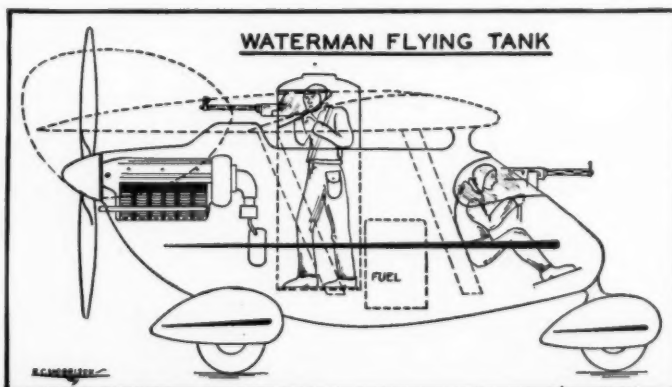
By ROBERT C. MORRISON

**H**ERE we go, thick and fast this month! The largest bundle of airplane to exit from Curtiss-Wright's plant at St. Louis will be a twin-engined transport! Carrying as many as thirty passengers the giant all-metal plane (we are almost certain it will be all-metal) will also have room for a goodly amount of freight. To pull all that load on two engines will certainly require power plants something in the neighborhood of Curtiss's new "double row" Cyclone 1,500 h.p. engines. These same engines, incidentally, are the ones to be used on Martin's new gull-winged navy boats, the first of which will be completed soon. Completion of the first Curtiss plane, the 1938 Curtiss Condor, will take place toward the end of this year. Thus the twin-engined transport has not as yet given way to these proposed four-engined giants completely.

Other news on the Curtiss front is a new Curtiss Hawk, and by next year they should have completed a new geared Whirlwind engine which is now about ready for first tests.



Here is the latest tailless plane which gets its stability by flying with an "upside down" wing. This reduces the C.P. travel.



Other engines above 1,500 hp. are well in the course of development by Curtiss-Wright. The War Department has just called for bids to be opened on March 17th, 1939, on twin-engined attack-bombers, and no doubt Curtiss will come forth with a much improved A-14 attack ship for a try at the contract. It should be stiff competition with perhaps Bell Aircraft in there too.

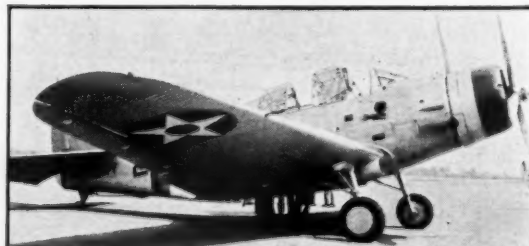
We do not seem to be able to get away from that big plane business. Activity is so great at the present time that each day discloses startling news on the new giant flyingboats proposed for the Atlantic route.

We have much news on French boat developments but that will be found in the latter part of this article where we tell how to build a model of one of the greatest French flyingboats ever designed.

Seversky set the pace when it disclosed that it intended to build a double-hulled flyingboat if Pan-American Airways was interested. Colonel Seversky (he is no longer a Major) disclosed that the wing spread of this flyingboat



A view of Uncle Sam's latest flying battleship, the Consolidated XPB2Y-1. Note the retractable wing tip floats. (Anderson)



The new Douglas torpedo plane, TDG-1. 114 of these go to the U. S. Navy. (L. Conner)





Two Russian bombing planes, the "N"-213 and "N"-169, that serviced the North Pole expedition. This is a rare view. (Sovfoto)

would be 250 feet! Gross weight would be 300,000 pounds. Accommodations would be made for 120 persons with a bath in each stateroom and a dining saloon seating 50 persons at one time. Then there would be the promenading decks in the leading edge of the wing as well as a cocktail lounge.

The tail of the Seversky would be mounted on booms, going aft from the wing, in which accommodations would be made for the passengers. Two large floats retract up to the bottom of these booms when the plane is in flight to make for more speed. Cargo and baggage would be carried in these floats, which would also make good landing decks for passengers when boarding the plane. Steps go from the floats into the wing. A large tear-drop designed compartment in the center section of the wing between the two tail booms accommodates the operating crew and next to it, in the wing proper, is the dining room.

It is debatable whether the power plant feature of the Seversky is good, for the engines are scattered about the plane and are not located at one central point.



This is the new twin engine 600 hp. Beechcraft "Hydro" No. 18. It will be sent to Puerto Rico. (G. Williams)



The new all metal frame 50 hp. Luscombe 8. (Tenety Jr.)



The new Aeronca K 40 hp. sportplane. (Morrison)

Four are tractors located in the nose of the tail booms in pairs which project some distance forward of the wing. Then there are four pushers, two being just aft of the crew compartment, attached to one propeller, and the other two on the trailing edge of the outboard wing panels. The engines will be of 2,000 hp. and perhaps of the Allison type.

Construction of the plane will be stainless steel, which brings up an important point. Mr. Bossi, executive in high standing at the Budd plant, is said to have mentioned that the new Boeing flyingboat will be the last big ship built of aluminum alloy. It is only likely that these proposed monsters will be of stainless steel and spot welded, and it has been Edward G. Budd's Fleetwings, Inc., that has shown the way. A whole fleet of army planes have taken on stainless steel wings (as we have related before) and have proven successful. The stainless steel situation has reached a crisis.

At the aircraft show in Los Angeles, Sikorsky displayed a model of a new flyingboat with very sleek and

(Continued on page 42)



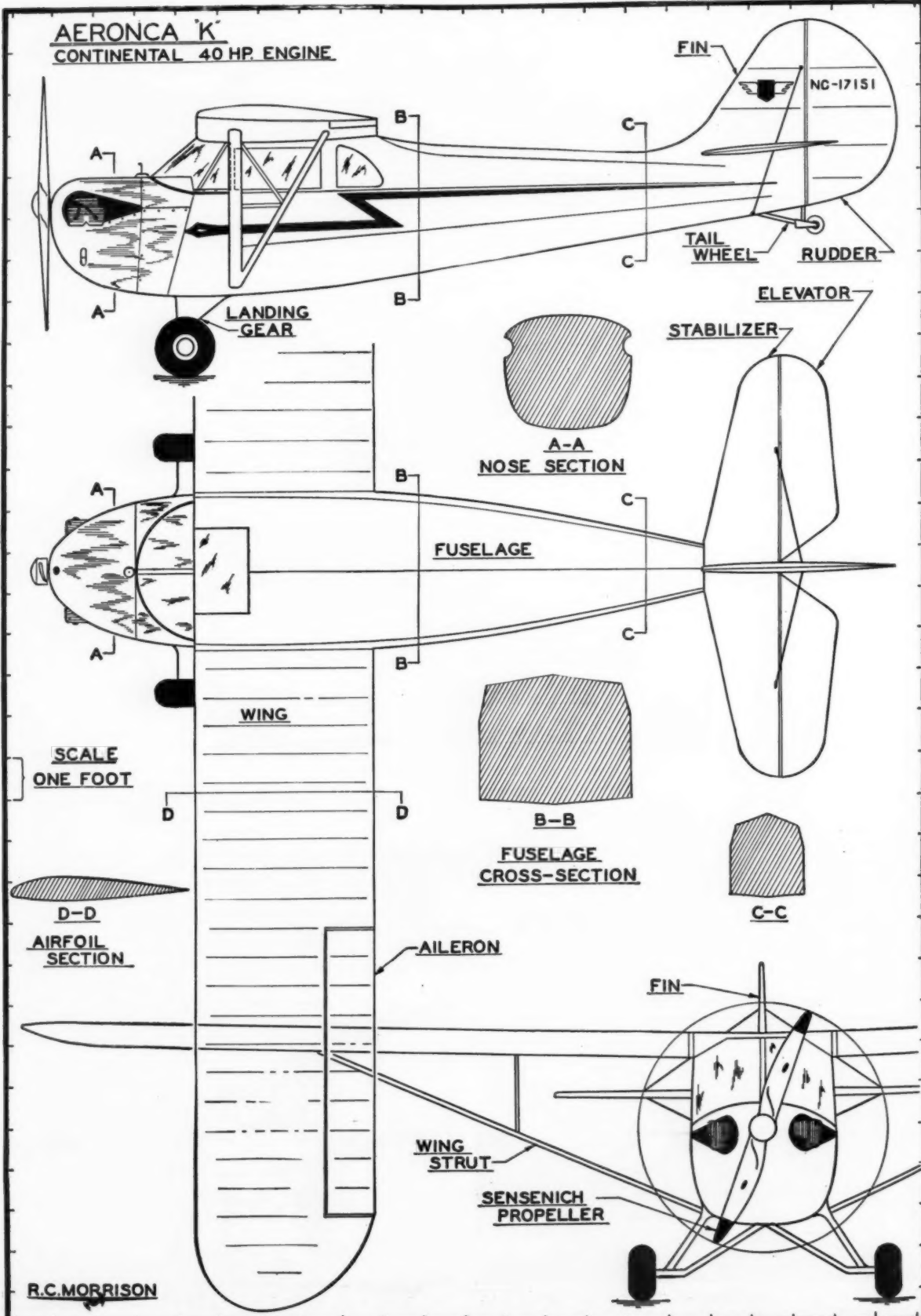
This shows the new type nose turret of the Douglas bomber, with bomber's window under the nose. (G. Williams)



This is not a gas model, but just a 20 foot single seat sportplane from England. (Globe)



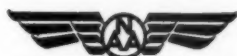
**AERONCA 'K'**  
CONTINENTAL 40 HP. ENGINE.



R.C. MORRISON



# National Aeronautic Association Junior Membership News



Prepared by National Aeronautic Association, Dupont Circle, Washington, D. C.

## FLASH!!

THE F. A. I. announces the establishment of three international "Brevets," or certificates, for model builders, patterned after the Class "A," "B" and "C" International Brevets issued for soaring pilots.

The regulations given for the obtaining of these Brevets are as follows:

"Model Brevet I: Make a flight of a minimum of one minute duration with a rubber powered or glider model.

"Model Brevet II: Make a flight of a minimum duration of two minutes with a rubber powered model, and a flight of a minimum duration of three minutes with a glider model.

"Model Brevet III of the F.A.I. shall be awarded to the candidate who shall have achieved with a model craft the following flights:

1. With a rubber powered motor: a flight of a duration of at least three minutes.

2. With a glider: a flight of a duration of at least five minutes.

"These flights must be made under the precise conditions set forth by the general regulations and the candidate must be a holder of the Sporting License.

"The supervision of the required performance shall be affirmed by an official approved by the National Aeronautic Association, and this supervision shall be made in accordance with the regulations of the general F.A.I.

"The take-off of rubber powered models must be made from the ground. The glider take-offs may be made: either by hand, shock cord, tow-line or track. These different take-offs shall be taken in accordance with the provisions under the general F.A.I. regulations.

"The candidate



A movie man "shoots" a speeding gas job disappearing in the distance.

Plans are shaping up well for the '38 Nationals. If you desire a set of rules and regulations, entrance blanks, parents' consent sheets, etc., drop a note now to the Model Contest Committee, care of the National Aeronautic Association, and enclose a self-addressed, stamped envelope in order that the information may be returned to you without delay. Don't forget!

## IMPORTANT

If you are not a member of the N.A.A. write NOW for application blank, to National Aeronautic Assn., Dupont Circle, Washington, D.C.

must certify in writing that he is the builder of the craft making the performance necessary to obtain Brevets I, II or III of the F.A.I. model builder.

"The performances required for the award of the Brevet may be made on different dates, and each trial shall be the subject of official report, according to the attached model for this report.

"Holding Brevet III of a model builder of the F.A.I. shall give a builder the right to wear a special insignia agreed upon by the F.A.I."

There have been so many other topics of interest, we have neglected the model chapters a little during the past couple of months. So we'll see what can be furnished in the way of up-to-the-minute news on this subject. Just listen to this!

Twenty-five new gas chapters were issued charters in March and April. Eleven of these new chapters joined in March and the other fourteen applied for charter in April. Let's see where these groups are: Denver, Colo.; Jacksonville, Fla.; Atlanta, Ga.; Baltimore, Md.; Kalamazoo, Mich.; Kansas City, Mo.; St. Louis, Mo.; Omaha, Neb.; Jersey City and Trenton, N.J.; Brooklyn (two chapters), New York City and Syracuse, N.Y.; Cincinnati and Lakewood, Ohio; Woodbyn and Philadelphia, Penna.; Arlington, Bellaire and San Antonio, Texas; and Seattle and Yakima, Washington!

Also in the past two months there have been five chapter charters issued to Junior, or rubber power chapters. This is by no means an indication that this type of model builder is losing ground to the gas fan. It represents the normal rate of growth of rubber power chapters as compared to the mushroom growth of the newer gas power division.

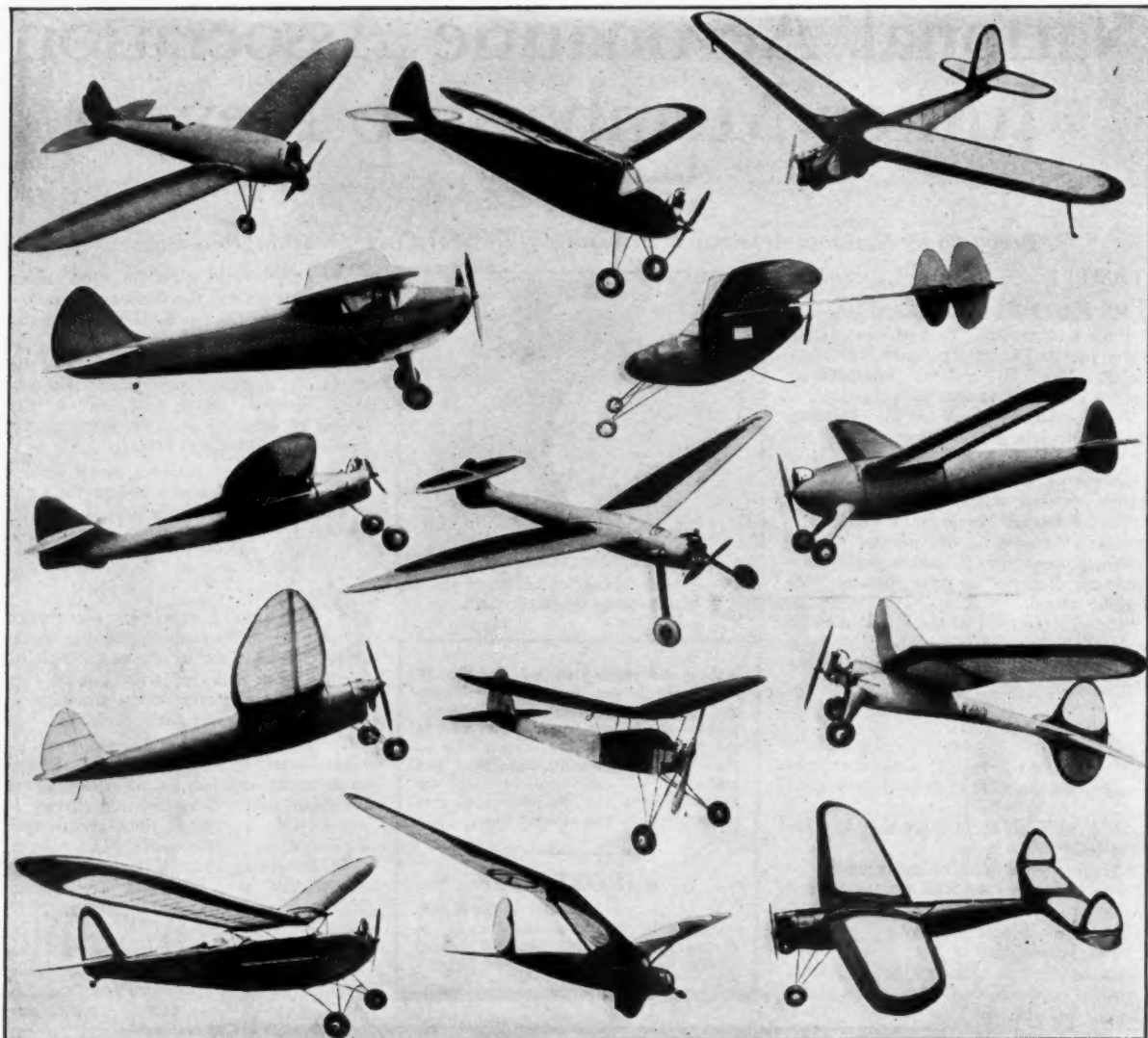
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3. Don Donohue, Highland Park, Cal.;  
4. J. Ginneti, Atlantic City, N.J.;  
Center, Wally Simmers, Chicago, Ill.



A view of the 1937 indoor contest in full swing at Detroit, Mich. 1. T. Harris, Toronto, Can.; 2. A. Koslow, Phila., Pa.;





Here are a few views of gas models that competed in the 1937 "Nationals." Do you remember these?

Gas flying is becoming increasingly popular, it is true, but this does not necessarily mean that the exacting science of successful rubber powered model flying has lost its power to challenge the skill of the American youth.

A report of this nature should be very encouraging to modelers who are contemplating the formation of a Gas or Junior N.A.A. chapter in their section. It is indicative of the confidence that model builders have in the future of model aviation in the U.S., and of the faith they hold in organized and representative groups, rather than in the haphazard and incomplete ability of the free-lance modeler.

#### First Louisiana State Board Meeting Successful

Swell news!! The plans for the Louisiana State Board of Model Aeronautics upon which Rocco S. Glorioso has so long been working have been completed, and the first meeting was held Thursday, April 24th, in the Court House at Lafayette, La.

The three major policies of the board are: 1. To pass on all requests for dates

and locations for sanctioned contests within the state. 2. To approve such requests before the N.A.A. sanction would be granted. 3. To pass on statewide records as the National Board does nationally.

The board will consist of a chairman who will preside over the board in every capacity. The members will include senior advisors, contest directors and other N.A.A. officials. Included in the board will be an educational director who is well qualified in that he must be a university graduate and hold at least a B. S. Degree.



The Louisiana State Board shows promise of being one of the outstanding regional organizations in the Junior N.A.A., as it is of great help in the state in helping to avoid conflicting state model meets, and is a step closer toward obtaining the introduction of model aeronautics into the public schools of Louisiana.

#### 1938 National Meet Information

Here are some of the more important

rule changes as passed by the Model Conference last March at Washington, and which apply to the '38 Nationals to be held at Detroit, July 6th to 9th inclusive:

Two separate rubber powered cabin events will be held outdoors at the Nationals: one event under American cabin rules, which will also serve as the Moffitt elimination contest; and the other under Wakefield rules for Wakefield team eliminations. The first six winners of the outdoor cabin event are to be chosen as the American representatives in the International Moffitt finals. The rules for the American outdoor cabin event limit wing area to not less than 100 square inches and not more than 200 square inches, with the standard weight rule of three ounces for every 100 square inches of wing area. The Stout Trophy will be featured as the first place award in this outdoor cabin event. Any type of power is permitted except gas.

Both the indoor cabin and the indoor stick events are limited to entries having from 30 to 150 square inches in wing area.

The minimum diameter of the wheels of an indoor cabin model shall be not less than



one inch. The minimum diameter of the wheels of an outdoor cabin model shall be not less than one and one-half inches.

Maximum weight for radio-controlled models shall not exceed 25 pounds.

Each contestant shall assemble all lifting surfaces and fuselage of his model. The design may be obtained from any source. Only the builder may fly the model for records.

With the exception of the above changes, the 1938 National Meet Rules remain the same as last year. 1938 Meet events are: INDOOR EVENTS; Stick, Cabin. OUTDOOR EVENTS; Stick, Cabin, International Wakefield Eliminations, International Moffitt Contest, Flying Scale, Gas Powered Endurance and Radio-Controlled Event.

And here's something you'll be interested in seeing. The 1938 Flying Scale Event rules, as submitted by the Rules Committee of the Academy of Model Aeronautics, are:

"The propellers must conform in diameter to the original, but may be altered in blade, width and pitch. All models will be judged according to the following point system:

General Workmanship:	Full Value	Judge's Estimate
1. Neatness of workmanship .....	8	.....
2. Amount of detail .....	8	.....
(Some builders go into more detail than others, reproducing engine cylinders, instrument boards, controls, lights, etc.)		
3. Originality in reproduction of parts .....	6	.....
4. Color and finish similarity .....	3	.....
Total .....	25	.....
Fidelity to Scale:		
1. Fuselage (length, depth, width) .....	5	.....
2. Wings (chord, span, airfoil) .....	5	.....
3. Landing gear .....	5	.....
4. Empennage (dimension of control surfaces) .....	5	.....
5. Engine-propeller .....	5	.....
Total .....	25	.....

In addition to the 50 points for general workmanship and scale, a model will be required to make a minimum thirty second flight. Twenty-five points will be offered for this minimum flight. Additional points, up to a maximum of twenty-five points, will be offered in proportionate amount between the minimum of thirty seconds and the maximum flight made during the meet. This makes a total of 100 points in all. A contestant may present only one model to be judged for workmanship. If this model cracks up before an official flight is made,



Famous model fliers who won at the 1937 "Nationals": 1. Dick Korda, Cleveland; 2. L. Bailey, Akron; 3. C. Goldberg, Chicago; 4. B. Anderson, Akron; 5. Herb Fish, Akron; 6. A. Dillon, Jackson, Mich.; 7. Max Sokol, Hamtramck, Mich.; 8. Leo Weiss, Brooklyn, N.Y.; 9. R. Wriston, Tulsa, Okla.; 11. Roy Stoner, Rockford, Ill.; Center, Alvie Dague of Tulsa, Okla., and one of the trophies he won.

a second or third model may be presented to be judged for workmanship."

### 1938 Scripps-Howard Jr. National Air Races Announced

Akron, Ohio, was selected by National

Junior Aviator officials as the site for the 1938 Scripps-Howard Junior National Air Races to be held August 30th to September 2nd.

This important annual event has been granted N.A.A. sanction, and will be conducted in accordance with official national rules. This year the meet will be open to all model builders the world over.



Al Williams judges John Reye's Comet Gulf Hawk in the Scripps-Howard contest.

Another impressive array of prizes is in store for the 1938 champions. Transcontinental air trips, snappy Gruen wrist watches, model supplies, magazine subscriptions and scores of handsome silver trophies, including the Major Al Williams' championship award and the American Airlines President's Trophy, along with \$600 in cash, will be distributed among the first ten place winners in each of the twelve events.

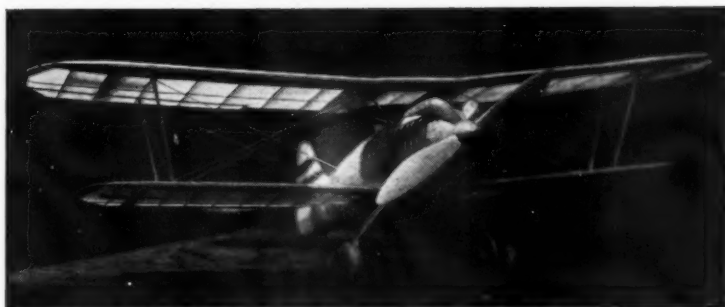
In addition to this big list, all winning contestants will attend the opening day's performance of the National Air Races in Cleveland as guests of Scripps-Howard

(Continued on page 60)









The finished plane with a scale propeller, worthy of any builder.

# Building The Heinkel "Pursuit"

By JESSE DAVIDSON

## How You Can Build a Carefully Detailed Flying Scale Model of a German War Plane That Has Gained Fame in Spain

SPAIN, the proving ground for the aircraft and ordnance of the mighty powers of the world, proved to some military observers in that unhappy war-torn country that Germany's much vaunted pursuit planes, which the Fascist forces were using, were strikingly inferior to the Loyalist manned Russian "P" model pursuit ships.

Since the beginning of the war in Spain, Germany has been feeding planes and pilots to Franco, and the Heinkel He 51 is an example of the type of aircraft supplied. This ship was designed three years ago when Hitler built the huge air force Germany now boasts. The He 51, particularly, served as the nucleus around which pursuit squadrons were to become the striking arm of the air force.

The Heinkel received its aerial baptism under fire in actual warfare in Spain when squadrons of them engaged in combat with the Loyalists' Russian Model P. The Russian P pursuit (cover design July, 1937 issue of M.A.N.) is the Soviet version of the American Boeing P-12-C, and its superiority in outmaneuvering the Heinkel manifested itself in the heavy damage inflicted upon the Heinkels. The Heinkels were quickly withdrawn from service and replaced with a more formidable fighter, the low wing Heinkel pursuit. Now the withdrawn models are used in the "Fatherland" as pursuit pilot trainers.

The Heinkel He 51 is a single seater pursuit-fighter normally powered with a 630 horsepower B.M.W. V1 engine. It is entirely of metal structure and fabric covered. It is also stressed to take an engine delivering 750 horsepower. Used in naval training, the He 51 is equipped with pontoons. Details of its military armament are unknown. However, its top speed at sea level is reputed to be in the neighborhood of 220 miles per hour.

It is interesting to know that Colonel Ernst Udet, former leading World War ace and now head of the technical section of the recently revived German air force, has the final say on all military

planes adopted for the service. No new plane is accepted into the air service which Col. Udet has not personally test flown and approved.

Our scale model has been designed from various photographs, inasmuch as no three-view drawings of this ship were available. To Ben Shereshaw, the writer is indebted for the use of his original drawings which he designed from that source. And to Martin Faynor, for his splendid workmanship in constructing the original model.

The model possesses excellent flying characteristics, having an extremely short take off, and it is consistently capable of flights over sixty seconds duration. Not many models will do this.

upright members. This also includes cementing cross members at right angles to all diagonal members forward of the cockpit. To the tail end of the fuselage frame a triangular tail post is cemented into position as shown. See full size drawings on plate 4. The rear hook is inserted afterwards into this post and cemented securely. Another piece of sheet balsa, wedge shaped, is fitted snugly between the lower longerons and cemented. This serves as a rest for the tail skid.

All formers with the exception of B-1A are cut to shape from 1/32" sheet balsa. Former B-1A is cut from 1/8" sheet. The notches in all bulkheads are cut to a depth of 1/16" and a width of 1/32". Care must be exercised in cutting the notch recesses, as much of the beauty of the framework lies in perfectly aligned stringers. Formers numbered with the letter T preceding, indicate its use as the top fuselage former. B indicates bottom former and S for the sides. When all the formers have been cemented into position note how the body hereon assumes an elliptical cross section. For the present, place the fuselage unit aside.

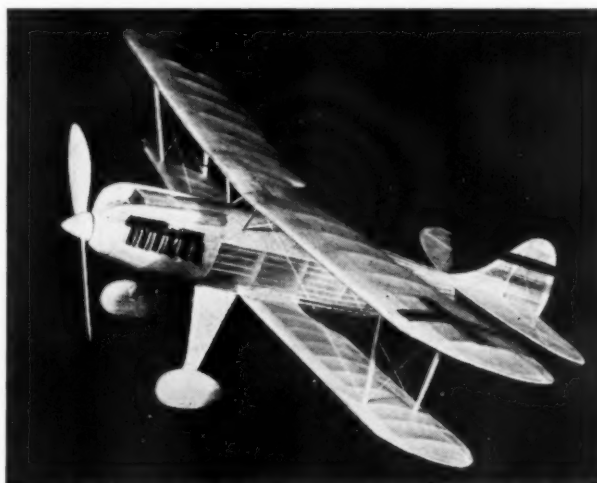
### Lower Wing Detail

All ribs used in the lower wing are cut from 1/32" stock. These ribs are identified by letters D, E and F. Cut out the required amount of the ribs, noting in particular that rib E requires two additional members, each having an extra spar notch which is shown in dotted lines. The lower wing panels are constructed in halves, and

are made in the following manner. The center wing spars measuring 1/16" x 1/8" are cemented in their respective notches on top and bottom surfaces of the ribs. Allow the rearmost spar to extend 1/4" beyond the double butted ribs F.

The same procedure is employed in attaching the leading and trailing edge spars. The leading edge spar is inserted diagonally into the notches, leaving it untrimmed at present in order to provide a gluing surface for the balsa sheet covering of the leading edge. The trailing

(Continued on page 52)



As realistic as any ship you have ever built and a fine performer as well. Note the refinements of structure.

### Fuselage Construction

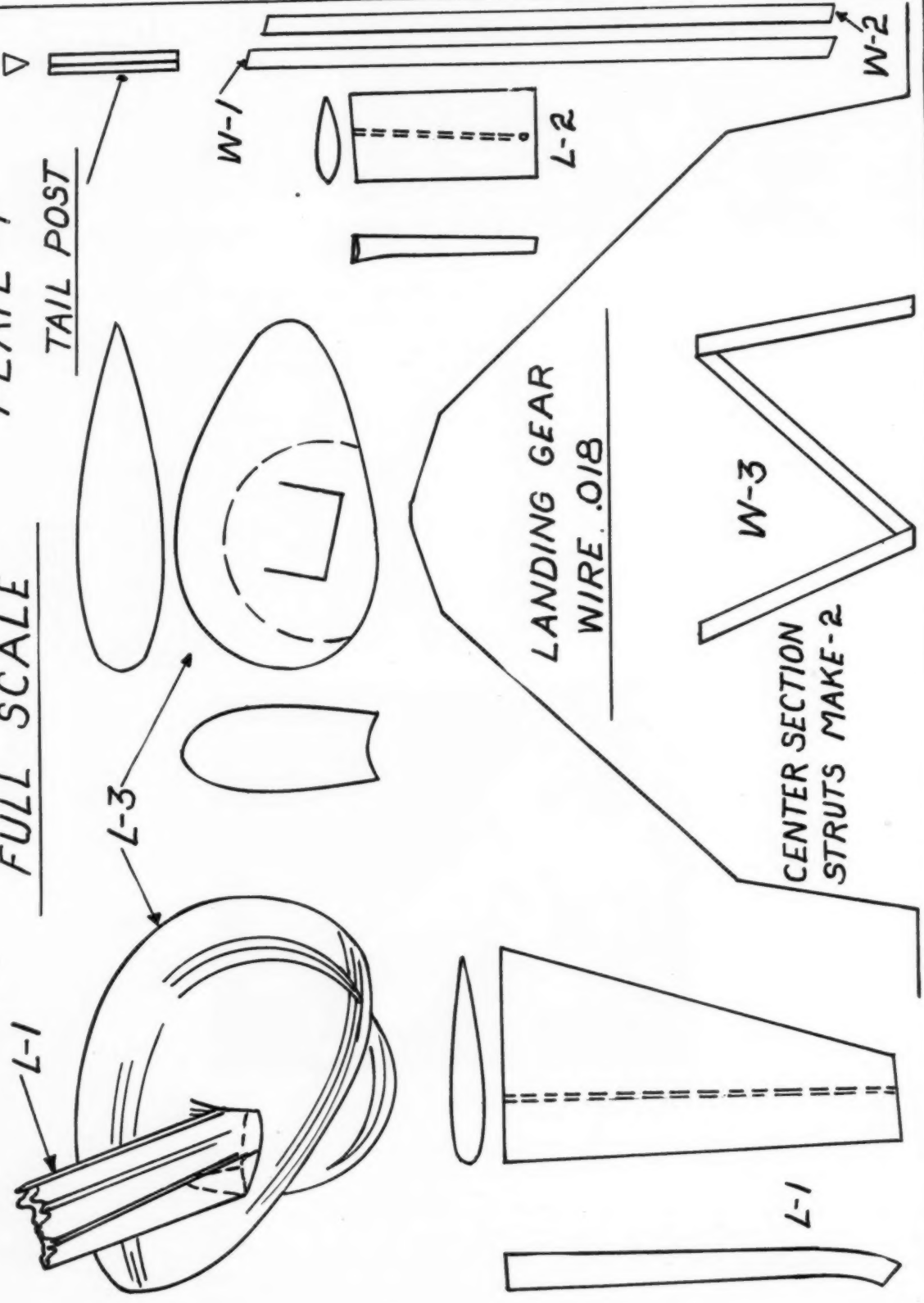
The first step is to make a full size drawing of the fuselage framework which is constructed of 1/16" square medium balsa. Select the longerons especially for their even bending qualities. The uprights and diagonal members are fitted between the upper and lower longerons with utmost care to insure perfect alignment and maximum strength. When both sides of the framework are completed they are joined together with cross members, which are cemented at right angles to all



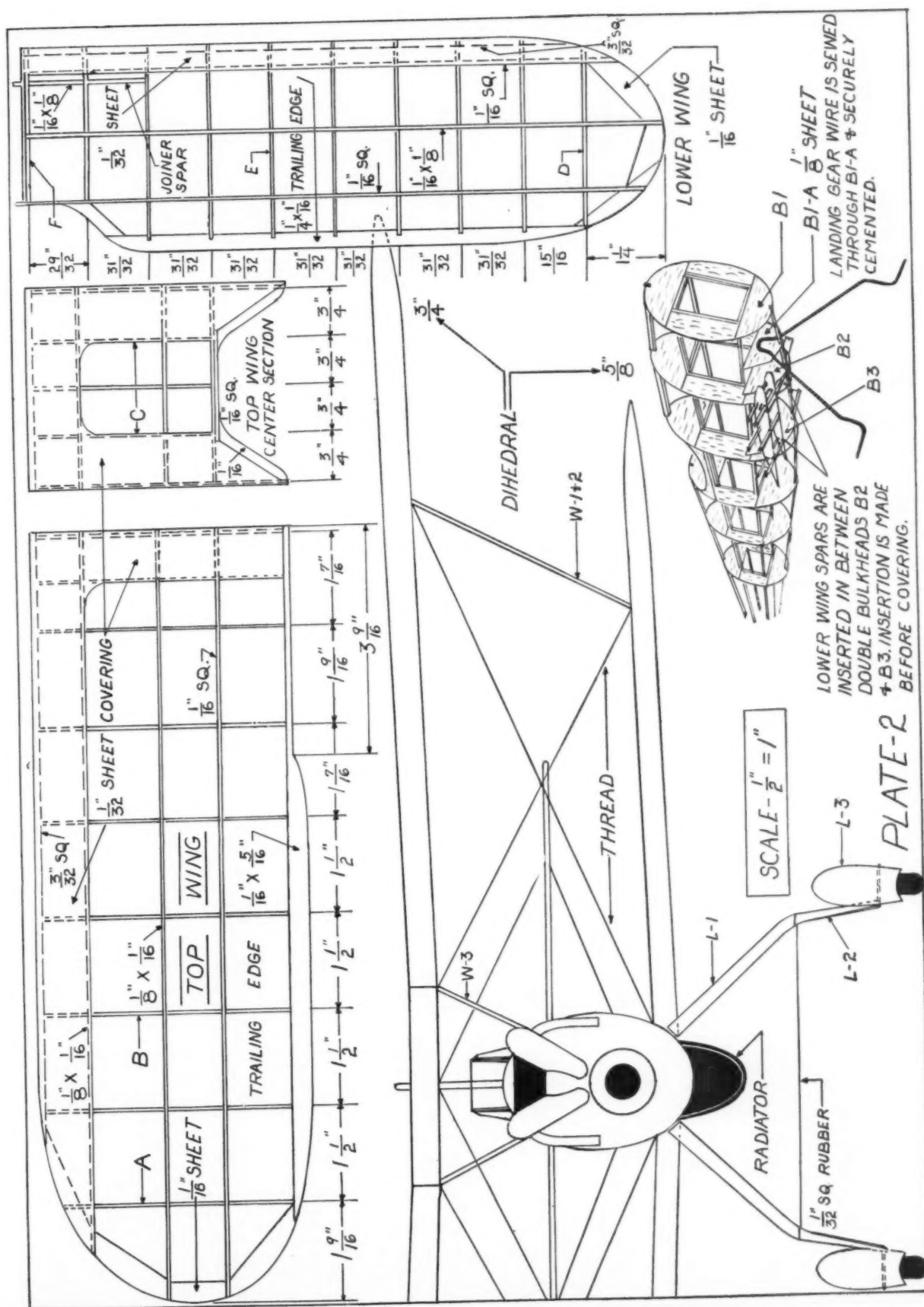
# PLATE -4

FULL SCALE

TAIL POST









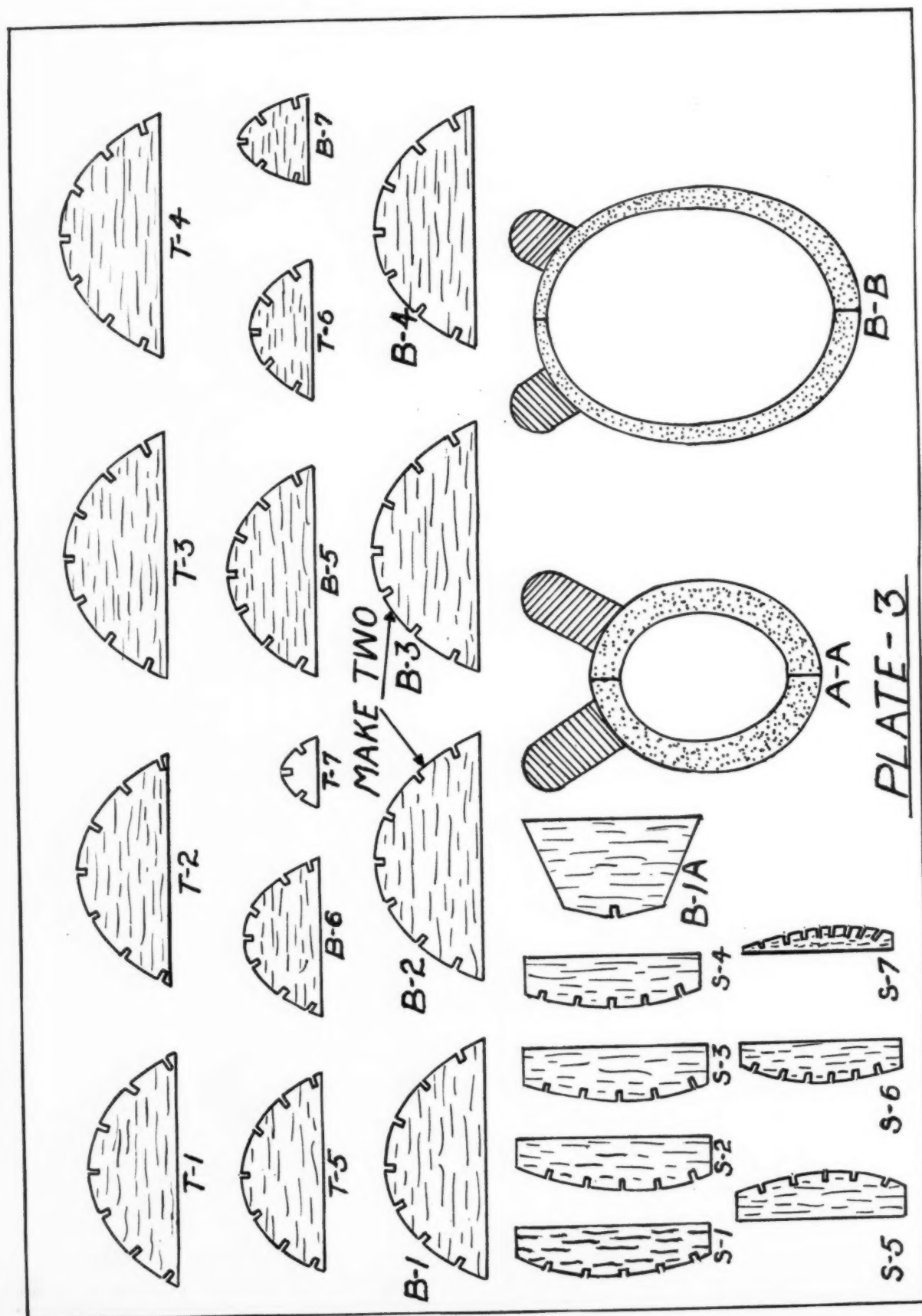


PLATE-3



# Designing Your Gas Model

Article No. 75

How You May Calculate With Great Accuracy the Exact Amount of Area the Fin and Stabilizer of Your Gas Model Should Have

Chapter No. 5

THE general rule of thumb for determining the correct amount of area to use in the tail surfaces, given in the preceding article, gives accurate values for average problems of design in which the model is not of unusual proportions. However, if these areas are calculated by means of the formulas, the designer may be assured that the values specified are absolutely accurate, regardless of the type or proportions of his models. Then the highest possible efficiency will result.

## Calculation of Fin Area

The first problem to be undertaken is the calculation of the correct amount of fin area. The formula for fin area is as follows:

$$A_F = \left( \frac{DN}{M^2} + 1 \right) \left[ (0.07) \left( \frac{A}{M} \right) (4 + N + \sqrt{ST_r}) \right]$$

The formula should be solved for  $A_F$ , the fin area. The other symbols in the formula represent the values entering the calculation, as follows:  $D$  = the propeller diameter in inches;  $N$  = the length of the fuselage nose from the C.G. to the rear face of the propeller hub;  $A$  = the total wing area;  $M$  = the tail moment arm (from the C.G. to the center of the fin);  $S$  = the span of the wings in inches and  $T_r$  = the distance in inches that each wing tip is raised above a horizontal plane passing through the highest point of the wing's center section.

The values of all these factors have been given or may be determined from known factors.

The diameter of the propeller ( $D$ ) is established directly by the power of the engine to be used. It has been decided that a 1/5 hp. engine is most advantageous for the planes which are being designed. The proportions of the planes have been established on this basis. Usually the normal running speed of such engines is 4000 revolutions per minute. In such a case experience has shown that the most efficient diameter of the propeller to use on engines of this speed and power is fifteen inches. Many builders use propellers of only fourteen inches, but it has been demonstrated beyond a doubt that greater efficiency will result when a propeller of slightly larger diameter is used. (Other details of the propeller, such as pitch and blade area, are secondary considerations in respect to choosing a propeller of the correct diameter and will be taken up later. The diameter of the propeller should be based solely on the power developed by the engine.)

The correct diameter of a propeller to be used on any power plant varies as the

square root of the power, the product of the pitch times the blade area and the revolutions per minute, being the same in all cases. Therefore the correct diameter of a propeller to be used on various engines may be determined, in case the model builder prefers to use an engine which develops more or less power than 1/5 hp.

Thus a 2/5 hp. engine should be equipped with a twenty inch propeller and a 1/6 hp. engine with a propeller of 12.5 to 13 inches in diameter, at a normal running speed of 4000 r.p.m. (Other details concerning the propeller will be given in

8.5% of the wing area.

By means of the rule of thumb, it was estimated that the fin area should be eighty-three square inches, allowing 8% less than the

normal amount of eighty-nine square inches for tapered wings. If an allowance is made for the tapered wings in the case of the formula fin area value, we have  $(0.92 \times 88)$  or  $(81)$  square inches of fin area as the correct amount to use on plane No. 1. This is the minimum value that should be used. Slightly more may be used if greater resistance to spinning is desired. As much as eighty-six square inches may be used with good results.

It is interesting to note that the estimation of the fin area by means of the general rule, checks very closely with the value derived by means of the formula.

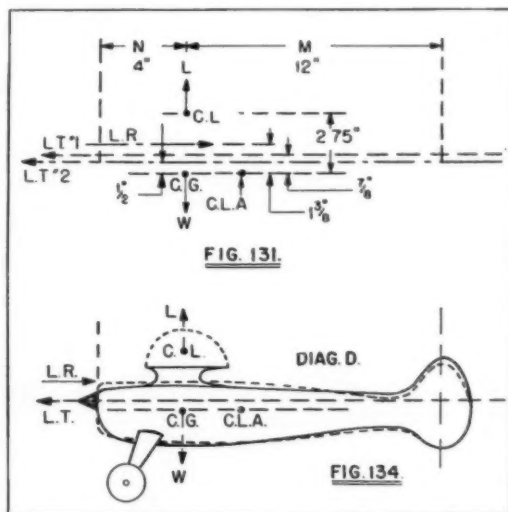
In light of the fact that plane No. 2 has exactly the same proportions as plane No. 1, the only difference being in its size, it is obvious that the fin area of plane No. 2 will be the same per cent of the wing area as plane No. 1.

Plane No. 2 has 677 square inches of wing area. Therefore the fin area for plane No. 2 should be 8.53% of 677 square inches, or 57.8 square inches, with an allowance being made for tapered wings. When such an allowance is made the required fin area is  $(0.92 \times 57.8)$  or 53.2 square inches. As much as fifty-seven square inches may be used when great stability is desired and when you wish the model to have a decided tendency to circle with the torque.

## Designing the Fin

If you have followed the procedure recommended in the first part of this discussion on gas model design you will have laid out a side view drawing of the proposed gas model on your drawing board. It will be similar in outline and proportion to Fig. No. 134. The plane in the figure has been proportioned so the C.L.A. (center of lateral area) is at a point about 20% of the tail moment arm ( $M$ ) back of the center of gravity. When it is in this position the fin will be approximately the correct size. When the side elevation of the model was laid out the general shape of the fin was outlined. Now the next step is to check the area of the fin on the layout. If its area is not the same as that specified by the solution of the formula, change its size but not its general shape, so that it will have the proper amount of area. This may be done by expanding or contracting the fin outline without changing its shape or relative proportions.

The area of the fin is considered to be the total vertical surface to the rear of the forwardmost point where the fin intersects the fuselage.



a future article. The above rules are merely approximate.)

Insomuch as the design of two planes is being outlined, (see article in June issue, page 29), two sets of values, one for each plane, will have to be inserted in the formula in order to determine the correct fin area for each plane.

$D = 15$  inches in both cases. In plane No. 1:  $N = 12$  inches;  $A = 1030$  square inches;  $M = 36$  inches;  $S = 90$  inches;  $T_r = 3/4$  inches per foot of wing span, or  $(0.75 \times 7.5) = 5.63$  inches, or  $5\frac{5}{8}$  inches.

Now the values should be substituted in the formula and the formula solved for  $A_F$  as follows:

$$A_F = \left( \frac{15(12)}{(36)^2} + 1 \right) \left[ (0.07) \left( \frac{1030}{36} \right) (4 + 12 + \sqrt{90(5.63)}) \right]$$

$$A_F = \left( \frac{180}{1296} + 1 \right) \left[ (0.07)(28)(16 + 22.5) \right]$$

$$A_F = (1.14)[77] = 88 \text{ square inches of fin area. This value is equal to}$$



# "Gas Lines"

Official Section of the National Aeronautic Association Gas Model Division and the I.G.M.A.A.

The Old I.G.M.A.A. Becomes A Permanent Organization of Gas Model Pioneers

**ATTENTION** every former I.G.M.A.A. member: We have something of the greatest importance to tell you. We will tell you the story by starting back a few years and sketch the development of gas model activity. In 1933 at the National Competition, Maxwell Bassett of Philadelphia startled model builders by making a clean sweep over rubber driven models with his gas powered ship. Everybody then began to investigate the possibilities of gas powered model planes, and great speculation passed through the minds of all model builders as to whether or not this phase of modeling would develop universally.

The answer to this question should have been obvious. The model builder has one quality to a higher degree than all the others. That is curiosity—he likes to experiment. Consequently thousands of model builders throughout the country began to "play" with the designs of gas model airplanes, with varying success.

With each succeeding year more of these young pioneers took up the hobby, until by the end of December, 1937, there were over 4,500 gas model enthusiasts enrolled in the International Gas Model Airplane Association, which was organized by MODEL AIRPLANE NEWS. Every member of this organization contributed something to the scientific and commercial development of gas models. Actually, by doing this, they have built up the air-mindedness of all young men throughout the country, as well as of many older people. This in turn is bound to reflect in the general advancement of aviation, which unquestionably will prove a vital means of defense in the future.

The I.G.M.A.A. sponsors and directors feel that these young men should be honored in some way and that the many helpful and pleasant associations made under the guidance of the I.G.M.A.A. should not cease. MODEL AIRPLANE NEWS therefore has established a re-organization of the I.G.M.A.A., which now becomes a permanent, honorary association of old members.

Every former I.G.M.A.A. member is eligible to become a member of this new organization. The new membership will continue for the life of the member or of the organization.

We want every old member of the I.G.M.A.A. to send in his application for membership immediately. The old I.G.M.A.A. card should accompany the letter. If, however, you do not have this card at present, send in your name, address, former leader (if any) and all other information that will be helpful in establishing your claim to membership. Every member who makes such application will receive an

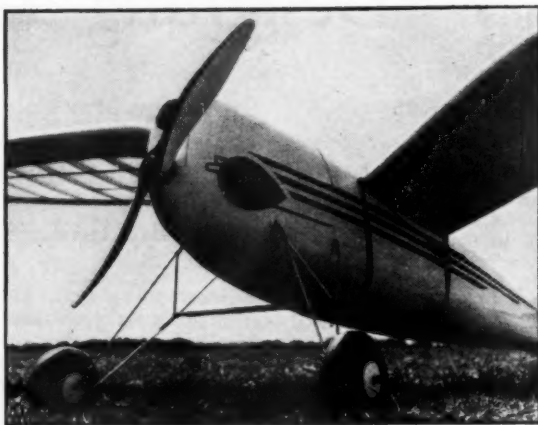
Honorary Gas Model Pioneer's Certificate. This will be a permanent recognition of his contribution to gas model science.

It is hoped that all old I.G.M.A.A. units will re-establish associations in their localities. In the future the "Gas Lines" columns in MODEL AIRPLANE NEWS will be devoted to news of the new association. An endeavor will be made to give the latest scientific developments and intimate sketches of the activities of members throughout the country. At an early date a "get together" meeting will be announced so that an interchange of views may be enjoyed by all those who attend. We are looking forward to the time when this organization will be the most influential body of gas model builders in the country.

Let us get together now to build up the prestige of gas model aviation and to protect it from those who would try to curtail activities in this field. Unquestionably rules must be made which will regulate gas model aviation. There are no model builders, or others, who are more qualified to establish such rules than the pioneers who built up the activities. It depends now upon former I.G.M.A.A. members to send in their application so that the new organization can be gotten under way and built up into a power for the vital development of gas models.

An appeal is made to every old I.G.M.A.A. leader to contact former members of his organization and acquaint him with this new development.

One of the largest and most active units of the old I.G.M.A.A., No. 7, has continued its rapid growth regardless of the change of the I.G.M.A.A. organization. This unit is



Pict. No. 1. Ed Burtins' nosey gas job gets in the way of the camera. It is a gull-wing, beautifully streamlined.

known as the Metropolitan Model League of 421 Seventh Avenue, New York City. Its leader is Mr. Irwin Polk. It sponsored the first important gas model airplane contest to be held in 1938 in the eastern part



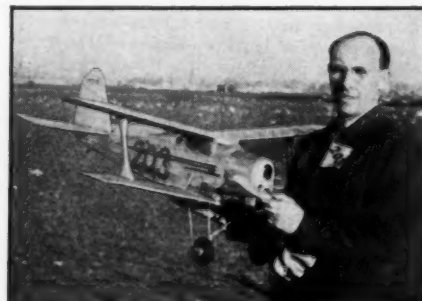
Pict. No. 5. Floyd Parks' gas model Stinson takes off at San Diego, Cal.



Pict. No. 4. Col. Seversky presents Frank Ehling with the Heathe Trophy at the Eastern States Meet.



Pict. No. 8. Peggy Snyder and her plane which won in the woman's event.



Pict. No. 7. The miniature gas powered Beechcraft which won in the biplane class.





Pict. No. 2. A contestant at the Eastern States Meet gets off his Buccaneer to a good start.



Pict. No. 3. Looking down the line of contestants at the Eastern States Meet at Seversky Airport.



Pict. No. 6. The low wing gas job that made the best flight in its class at the San Diego meet.



Pict. No. 9. Mr. H. Congable with his Made-well Mite powered "Old Reliable" gas model. It weighs 27 oz.

of the country. This contest was conducted at Seversky Field, Farmingdale, New York, on April 24th. Its title was the Official Eastern States Championship Model Air-



Pict. No. 10. Roland Fischer and his plane that flew for 26 min., 25 1/5 sec., at Denver.

plane Contest. The National Aeronautic Association granted a sanction, and Mr. Polk directed it personally. Mr. Polk was N.A.A. Manager of the 1937 National Model Airplane Championship Competition, held in Detroit, and will manage the meet again this year. The events at the contest were as follows:

1—Event for replicas of man-carrying aircraft powered with small engines.

2—Event for replicas of man-carrying aircraft powered with larger engines.

3—Event for endurance models powered with small engines.

4—Event for endurance models powered with small engines or large engines.

About 300 contestants were enrolled and every type of gas powered model craft was present. Colonel Alexander P. deSeversky was kind enough to lend the field for the occasion, as well as his moral support to the affair by personally assisting in timing and judging the events. Mr. Philip Shays of the Seversky Corporation, the officers and men of Mitchell Field and the Richfield Oil Company lend valuable assistance by acting as officials and judges. The following concerns contributed materially to the contest by donating awards:

MODEL AIRPLANE NEWS, Scientific Model Airplane Company, Condor Midget Motors, Heathe Model Airplane Company, Syncro Devices Inc., Ohlsson Miniatures, "Flying Aces" Magazine, International Models, W. J. Voit Robber Corp., Long Island Hobby Shop, Ideal Model Airplane & Supply Company, Seversky Aircraft Corp., Comet Model Airplane Company, Roosevelt Model Airplane Supply Company, M & M Model Wheel Company, Reginald Denny Industries, Howes Adjustable Pitch Propellers, Re-Nu Battery Sales Corp., Berry Brothers Inc., New Cyclone Model Company, Bay Ridge Model Airplane & Supply Company, JASCO, "Air Trails" Magazine.

Unfortunately it was very windy on the day of the meet. This caused a number of crack-ups and discouraged many contestants from participating in the events, though they were on hand. It was the

kind of a day on which any faults in the design of the contestant's model craft was sure to result in a cracked-up ship. Models, in order to fly in such windy weather, had to be superstable and to be of faultless design. In spite of the weather handicap many remarkable flights were made.

One of the most unique ships present is shown in picture No. 1. The plane was built by Ed Burtins and is of the gull-wing type. Close inspection will disclose the careful design and neat workmanship put into this craft. As you can see the motor is entirely enclosed with a small grilled opening, designed to allow inspection and care of the motor. The ship has been streamlined to a high degree.

Picture No. 2 shows one of the dramatic moments at the contest. It was snapped at the moment a "Buccaneer" was taking off the runway. This is one of the most thrilling moments in any gas model builder's life.

Picture No. 3 gives a good idea of the intense activity that takes place. Here you see the model pits with their builders preparing their planes and awaiting a propitious moment for flights, between wind gusts. A number of the young scientists are engaging in discussing gas model affairs with one another. The customary number of fascinated spectators are giving some of the planes the "once over."

Picture No. 4 is typical of one of the big moments in any gas model builder's life. Here you see smiling Frank Ehling receiving the Heathe Trophy from Colonel deSeversky, which he won with his Elf powered Cessna as the most outstanding plane powered with a midget engine. As one of the most expert builders in the country, and as is customary with those who know the game, he is most retiring and even shy. He possesses a most important quality—he is original and thinks for himself. It is seldom that he copies anyone else's ideas. At the extreme right of the picture Mr. Polk may be seen, caught in a moment of deep thought.

Edmund Seegauler of the Bronx, New York, won the Polk trophy in the larger duration event with a flight of 3 minutes, 37 seconds. Mangus Anderson of New York City won a Condor Midget engine. Morris Shepard won a Syncro Ace engine. Stanley Humphries won the Flying Aces (Continued on page 58)







# More Power For Your Cub

SOMEHOW it hadn't occurred to the writer at the time his "Cub" gas job (plans published in the February and March issues)

was being test-flown with its original engine, just how much additional *real performance* could be obtained by using an engine of increased horsepower. Quite content with stellar performance shown during test flights one might say we should leave well enough alone.

Recently however, suggestions from a number of local modellers prompted us in preparing the accompanying plan, which gives clear and concise details for mounting, as an example, a Brown Jr. 1/5 horsepower engine. Other makes of dependable engines of equal horsepower can be used also with but slight variations in the positions of the runner notches on bulkhead formers F-1, 3, 4, 5, and the nose cowl itself.

The plan on the opposite page shows the four important bulkhead formers which provide the main support for the runners. Dotted lines nearest the notches indicate the position of the original Baby Cyclone mounting. Builders constructing the Cub, to be powered with the Brown Jr., should naturally disregard bulkheads F-1, 3, 4, 5 as published in the February 1938 issue of M. A. N., using instead those presented here. The rest of the construction details of the Cub, with the exception of the motor

## How You Can Mount A 1/5 Horsepower Engine in the "Cub" Presented in the April and March Issues of This Magazine

By JESSE DAVIDSON

mount and nose cowl, may be followed as described in the instructions in the first installment.

The problem in question remains however, what to do about the required changes in a ship already completed? A relatively minor problem to be sure, and so one goes about it in the following manner:

The first step would be to disassemble the ship completely. Wings, tail surfaces, landing gear, nose cowl, side windows, all off. This leaves the fuselage itself to be handled in a free unobstructed manner. The next step is to carefully remove the gusset plate on each side of the runner units, and after that, the bass motor mount supports. With the aid of a long thin-bladed knife remove all twelve triangular runner brace blocks. Lastly, carefully work the point edge of the blade in and around to loosen up the places where the sides of the runners are cemented to the bulkhead formers. When completed, withdraw the entire unit.

The width measurements required for the new notches, in order to accommodate a wider engine mount, are taken directly from the plans and markings made accordingly

onto the formers. Check your figures again before attempting to cut the new notches in position.

This operation completed, make a new set of twelve triangular runner brace blocks. The runner units are once again inserted into position and cement is applied generously to all wood points. Allow plenty of time for the cement to harden before attaching the runner brace blocks into position again. The brace blocks aid in providing greater rigidity to the runner units.

The new engine bearer has slight changes also. The toggle switch mount was necessarily moved further back but is still conveniently accessible for manipulation merely by raising either side cabin window. A sheet balsa condenser mount serves as a bed in which the condenser unit is held snugly between two rattle-proof clips. These are shaped, as shown, from .024 steel wire. The coil rests in its cradle mount, and fastened with a metal strap as shown. Battery units are held tightly in place by the close fitting positive and negative contacts. A larger tie-down hook will have to be bent to shape inasmuch as the greater width for the new engine bearers demands it. This is, of course, of the same design shown in the Cub drawings of the February 1938 issue.

A close study of the nose cowl makes the  
(Continued on page 55)

## The Plane On The Cover

THE decision in favor of four-engined planes exclusively, made recently by the Boeing Airplane Company of Seattle, Washington, will bear fruit this summer when the first model 307 "Stratoliner" land-plane rolls from the factory. And this is the ship pictured in the striking view on our cover this month.

A development of the internationally famous model 299, known to the world as the YB-17 Air Corps Bomber, this new giant of the airlines promises to be the most luxurious flying craft ever built.

It is the first plane in the United States to be constructed for operation in the stratosphere and its supercharged, sealed cabin is so designed as to maintain the atmospheric conditions found at 12,000 feet even though the ship itself is flying at an altitude of 20,000 feet or above.

Passenger accommodations include provisions for 33 persons in the daytime. At night these seats may be folded into comfortable sleeping berths to provide high flying rest for 25 passengers. These berths are six feet, seven inches long, ample room for even the tallest ticket purchaser.

The crew is made up of a pilot, or Captain as he has become known, co-pilot, or First Officer; a radio and ground communications officer, a steward and a stewardess. The first three mentioned are housed in the extreme forward portion of the whale-like

fuselage. Entrance is gained through a trap door under the nose through which baggage is also passed. The spherical contour of the nose is uninterrupted by the usual break for the windshield, this latter being constructed so that a maximum vision is obtained through a smooth, curved windshield encircling the nose.

The main deck is entered through a heavy, hatch-like side door which can be sealed air-tight, necessarily so for its sub-stratospheric operation. Along the port windows is a row of deep, comfortable reclining chairs seating nine persons. On the starboard, or right hand, side of the cabin, are four drawing room compartments seating six persons each. It is these latter tiers of seats that are converted into berths for night travel.

Large, special glassed windows are provided for each row of seats. This glass is made of a special alloy that prevents dangerous ultra-violet rays from burning the passengers. At the extreme altitudes the earth's protective covering of ozone has thinned and sunburn must be diligently guarded against. Also in each compartment are adjustable vents for the conditioned air, reading lamps, and call buttons for the steward or stewardess.

A great deal of ingenious engineering and artistic designing skill have gone into the ladies' and men's lavatory. The women's

lounge has a floor area of 34 square feet and an entire wall is covered with a tube-light mirror so that the ladies may have ample reflection for their face creaming and hair brushing. It also contains running hot and cold water, fresh towels and waste container, ash trays, two dressing tables, and built-in towel shelves.

In the men's room are found many of the conveniences so dear to the hearts of traveling males, chief of which is the electric razor outlet. He may now have his morning shave traveling at 240 miles per hour, 20,000 feet in the sub-stratosphere, a truth doomed to fantasy a decade ago. The men's room is seven feet high and contains a spare chair so that late comers may wait their turn in comfort. Thoughtfully enough, toilet facilities are in a small adjoining room in both dressing rooms.

There is also a lower deck wherein are contained mail and baggage and special emergency tools reached either through a trap door in the cabin or through a regular hatch from the exterior. The cargo compartment will accommodate two tons of baggage, mail and express.

The kitchen is located in the extreme aft portion of the main deck and a complete meal for 33 persons may be cooked and served in this cleverly constructed 28 square feet of space. It contains large cupboard

(Continued on page 40)







# 1ST, 2ND, & 3RD PLACES AT MIAMI

FLY BY MORLEY V. FRIEDEL, WINS 1st PLACE AT  
MODEL MEET IN CALIFORNIA

MODEL WINS 1st PLACE AT EASTERN STATES CHAMPIONSHIP MEET  
24th MERSKY FIELD, LONG ISLAND, NEW YORK

widely-attended meet with a spectacular flight. Mr. Seegmuller also won the 1937 Luscombe  
model. And now comes word of Scientific models winning 1st, 2nd, and 3rd places at the All-American  
Robert "Miss Philadelphia": Earl Watson, flying "The Streamliner"; Fred Laudenthal, flying "Red  
frames" in spite of unfavorable weather conditions, the spectacular flight of Scientific models proved  
flyers, through with remarkable performances under any circumstances.

## Powered Model Airplane—The FIREFLY

Flies to (5200 Feet)

Complete Kit

**\$1.95**

POST-PAID

or at your dealer including M & M Pneumatic rubber wheels



FOR THE MODELS—A DUMMY ENGINE IS SUPPLIED WITH EACH KIT

## THE THRILLS OF GAS MODEL FLIGHT!

THEY LOOK,  
FLY, AND SOUND  
LIKE REAL  
GAS MODELS



Span 36" Length 28" Weight 4 oz.

gas-type rubber-powered model will give you all the thrills of building and fly-  
ing a gas model at a fraction of the cost.

CONTAINS EVERYTHING required to build the model 100% complete: Pair of  
M & M pneumatic wheels with inflating tube; true-pitch 10" balsa propeller; ribs,  
foams, etc., printed on balsa; cement; clear dope; rubber  
band, etc.; brown contest rubber; all necessary metal for building ratchet  
effect; easily understood plans including all information on building  
the "Flea" model.

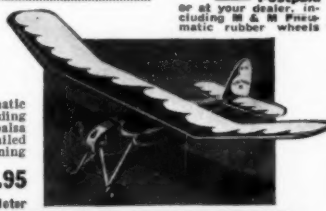
Like a gas model—flies like a gas model—sounds like a gas model—

## MISS PHILADELPHIA

Span 36" Length 57 in.  
Weight (less motor) 3 1/2 lbs.

includes everything required including 3 1/2 in. Pneumatic  
wheel, finished hardwood propeller, ready shaped leading  
edges with notches ready cut and finished balsa  
rib notches for spars, complete plans and detailed  
instructions explaining  
entire con-  
struction. Complete kit... **\$9.95**

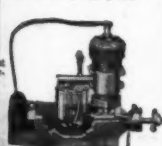
Postpaid Less Motor



## MODEL SUPPLIES

TRU-PITCH  
GAS PROPS **75c**  
Each

13", 14", 15", 16"



## THE NEW OHLSSON

With transparent celluloid  
body tank: 7/8" bore,  
15/16" stroke, 500 to  
14,500 R.P.M., 1/2 H.P.,  
less weight 6 1/2 oz.,  
height 4 3/4", 20 min. on  
1 cc. fuel. Radial or side  
mounting. Complete with  
tank, coil and condenser.  
Postpaid... **\$18.50**

Postpaid



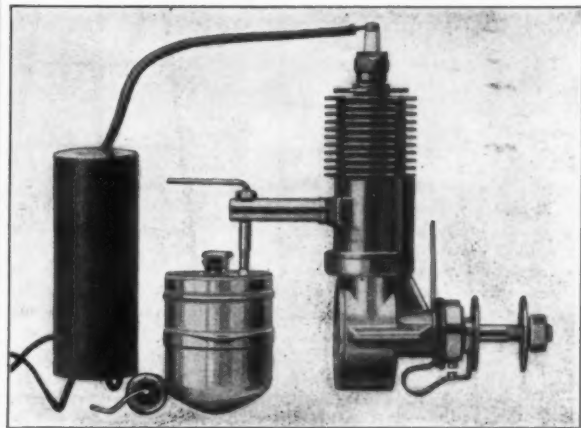
## THE STREAMLINER

Wingspan 6 ft.; Weight (Less motor) 2 1/2 lbs.; Length 43"  
Gas model builders from coast to coast are acclaiming this new gas  
model. The Streamliner is really an advanced type of gas model,  
and the kit is the most complete on the market. Complete con-  
struction kit. Postpaid, or at your dealer, \$4.95 Less motor and  
wheels. Complete kit as described above, but including a pair of  
3/4" pneumatic rubber air wheels (value \$1.50) **\$5.95**

pair) Less motor, POSTPAID.

For any items advertised on these pages, see your local dealer  
or order direct from Scientific.

## First Choice THROUGHOUT AMERICA



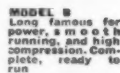
## SCIENTIFIC OFFERS YOU THIS FINE NEW MODEL D BROWN JR. ENGINE

At the Exceptionally Low Price of

ONLY **\$10**  
Complete,  
Ready to Run

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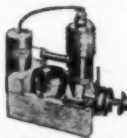
—IMMEDIATE DELIVERY—



MODEL B  
Long famous for  
power, smooth  
running, and high  
compression. Com-  
plete, ready to run  
**\$21.50**  
Postpaid



MODEL M  
MARINE  
Built to high ex-  
acting standards  
for use in model  
boats. Complete,  
ready to run  
**\$15.00**  
Including  
Flywheel  
Postpaid



MODEL C  
Offers the proven  
advantages of the  
Brown Jr. motor  
at a medium  
price. Complete,  
ready to run  
**\$17.00**  
Postpaid

THE New Model "D" has everything that users have  
come to expect of Brown Junior Motors: power, speed,  
stamina, and sound engineering advances. In every way it  
lines up with the famous Brown motors that have won first  
places and flight records everywhere. The same high quality  
materials and light records everywhere. The same high quality  
materials are used, such as alloy steel cylinder with aluminum  
alloy piston and 2 special rings, forged aluminum con-  
necting rod, simplified pin type control, and other high  
quality features. Not long ago you had to pay as much for  
a knockdown motor kit as you do now for the completely  
finished ready-to-run Brown Jr. precision motor. For the  
power delivered, the Brown Jr. motor is undoubtedly the  
lightest miniature gasoline motor manufactured, thoroughly  
tested and run under actual performance conditions. For  
100% satisfaction power your model with a Brown Jr.  
motor. Order early from Scientific for immediate delivery.  
COMPLETE ENGINE READY TO RUN, INCLUDING FUEL  
TANK, COIL, CONDENSER, ETC., ONLY \$10.00, POSTPAID.

### GENERAL SPECIFICATIONS

7/8" Bore, 1" stroke, 1,200-10,000 R.P.M.  
Height 4 3/4", 1/2" Horsepower.  
Actual scale weights: Bare motor... 6 1/2 ozs.  
Complete with oil, tank, and condenser (as  
furnished)... 11 1/2 ozs.  
Ready to run, with gas, two batteries, and pro-  
peller... 20 1/2 ozs.  
Two standard 1 1/2 volt flashlight cells required for current.

Included at no additional cost is a motor  
manual containing all information  
on the operation and care of your engine. This  
manual is included with all Brown Jr. engines.

### DOUBLE GUARANTEE

Buy your gas engine from SCIENTIFIC and  
you will be protected by the double guar-  
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# How to Build the 1937 Wakefield Winner

Here Are Complete Plans and Data From Which You Can Build a Duplicate of the Plane That Won the 1937 Wakefield Contest for France

By FRANK ZAIC

From Data and Plans Supplied by Emmanuel Fillon and J. Desnoes

**WE EASILY** forget who was who in the past local and national contests, but we cannot forget the winner and the country which wins the Wakefield Cup. 1937 shall be remembered as the French year, not because of the marvellous Exposition, but because one of her sons won the Wakefield Trophy.

As you read on you will wonder why Mr. Fillon thinks so much of himself. The truth is that he is not acquainted well enough with the English language to write this himself. So, Mr. Desnoes and I can go right ahead and tell you all about him without his being the wiser. He will undoubtedly blush when this is translated to him, and smile in happiness.

There is history behind this article. After the Wakefield competition was over, I suggested to Mr. Fillon through Mr. Desnoes, that Mr. Grant would be glad to have the American rights to his plans. Both were pleased with the suggestion and Fillon promised to have scaled drawings ready when I arrived in Paris. He kept his promise and I picked up the plans while I passed through the French capital, made penciled drawings from them and changed the metric system to our own. When I returned to Paris on my way back I tried to have them checked. In the meanwhile Emmanuel was called to service. So I appealed to Mr. Desnoes to help me finish this article. I left the drawings and a questionnaire with him, and at the same time tried to get a clear picture of the French background so that this article would be authentic.

The drawings and answers arrived soon after I reached home. So that the following is more or less a combination of three parties. If on occasion you are a bit perplexed, just remember that I don't know French. However, you may be assured that the drawings are exact because they were checked. The background of history is also true.

France heard about the International Wakefield Competition for the first time in 1934. Mr. Desnoes was the first visitor at that time and he saw Mr. Allman win for Britain. He carried the tale back home and thereby planted the seed, returning again to England in 1935. Besides bringing his own ship he also entered one for Mr. Robert Guillemard, for proxy flying. It seems that their models did not perform as well as those of other contestants! And no wonder! Having no contact with outside designs they had to rely on their own past

experience and judgment. We can appreciate this point by recalling our own 1927 days. In fact they were further handicapped by not knowing about the celluloid dope. It seems that they used silk covering and tightened it up with gelatine, (starch, Mr. Desnoes?) so that a slightest bit of moisture would convert the "V" dihedral into an "A."

Time glides on, and two years have passed. It is midsummer of 1937. The Frenchmen have been busy since 1935 and by now they are on equal terms with the rest of us as far as knowing what is good and what is bad in model flying. It is true that they do not yet have the large number of fairly good builders as we have. However, they can match almost number for number with experts. 1937 acknowledged the following French top notchers: Vincré, Fillon, Chabot, Lemoine, Degler and Ducrot in the powered section. While Paulain and Faure stood pat on the glider laurels. We are sure that there are more who deserve mention, but these young men made history by their consistent contest winning.

The design trend or style developed to the present date is towards heavier wing loading, such as our own three oz. for 100 sq. in., and the Wakefield requirements. The general size has also been increased to larger outlines, such as 40 to 60 inch spans and proportionate fuselages. Of course smaller jobs are still being built by the growing experts but the above size is used by the experienced modelists. Streamlining is considered and applied practically, as you can see from Fillon's design. More attention will be called to this in the model's description. The power ratio is also creeping up. Two or three years ago 25% was considered ample. But as time, experience and contact with the rest of the model world developed, the rubber slowly increased to about 35% in 1936. It is now 40% to 50% of the total. However, the Wakefield designs use the lower figure because of their high total weight. But the knowledge of the advantage of having as much power as possible is known. So that our own (American) secret of long flights is no longer a mystery to anyone. Naturally, large props are used to consume this power economically. Gears are used here and there. Mr. Vincré is most successful in using the rear-return system. Balsa construction is universal. Silk is still preferred by a few, but Japan paper predominates by large odds.



Emmanuel Fillon and his plane with which he won the Wakefield Trophy.

Mr. Desnoes tells me that he is not at all satisfied with his lot in just having only one F.A.I. certified record of 14 minutes 30% seconds, for fuselage models. It seems that he was dogged by a series of hard luck events. I personally witnessed one flight at the Exposition contest, when one of the younger fellows backed over his parked fuselage.

The present French organization for model activities is centered in Comité Français des Modèles Réduits, composed of two Model Federations and Ligue Aéronautique de France. This Comité is under the supervision of the French Air Ministry.

This then is the background in which Fillon developed into the world champion. Now, a few words about him.

It seems that he inherited his interest in models, since his dad was bitten by the "model bug" way back in 1909. His first contact with organized club was in 1934, when he joined the "Escadre de la Rose des Vents" which is still very active.

His Wakefield design is personal, according to Mr. Desnoes. Although it has earmarks of Mr. Vincré's Coupe de France winner, it differs in detail such as airfoil sections, wing and tail combination, outline, prop and rubber combination, and many other small things which have so much to do in contributing to its success. The similarity in appearance can be easily attributed to the world-wide practice of having most of the current designs of same pattern. Also, we must never forget that no matter how good a design may be, the final result usually depends on the man who builds and flies it. This model was built especially for the Wakefield meet, and it showed its championship streak by placing second in the trials.

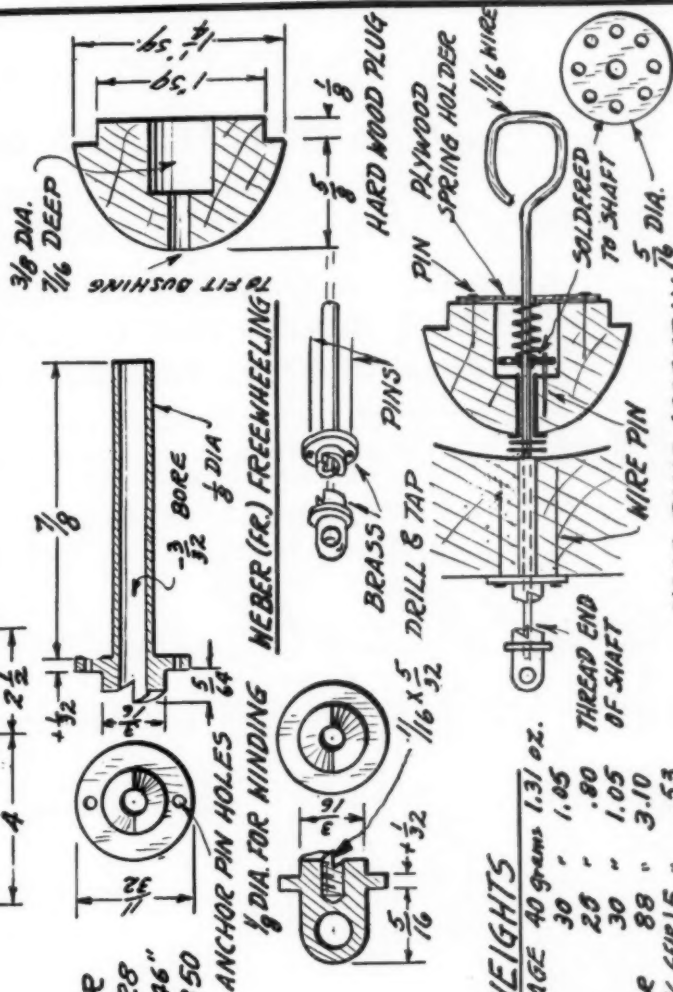
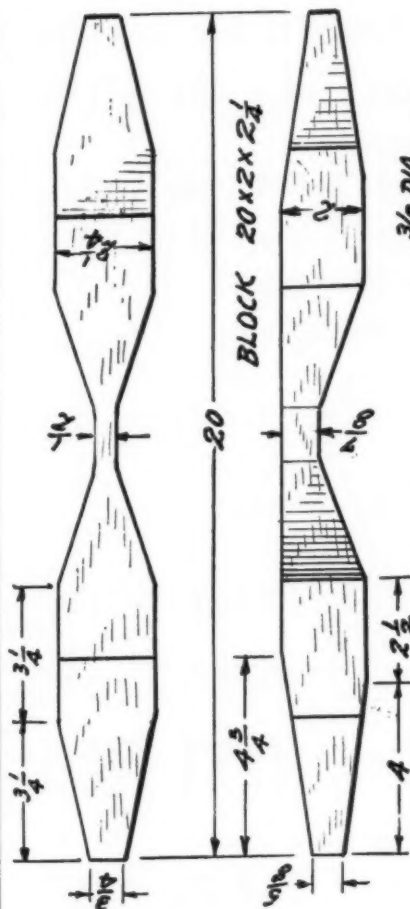
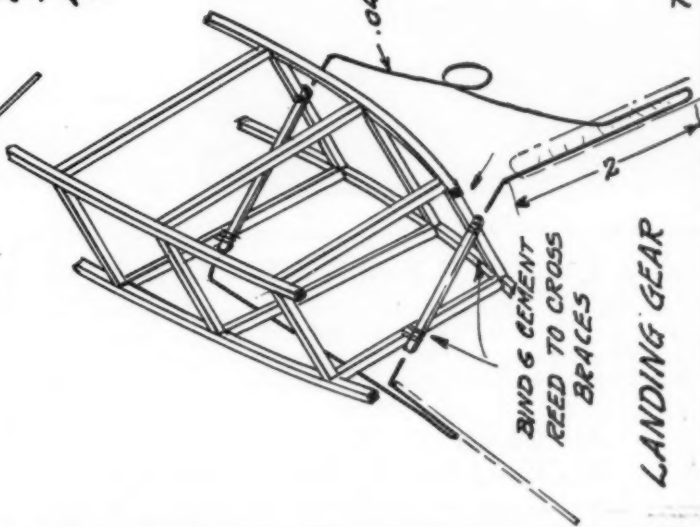
The model was flown only twice in the Wakefield contest. The first flight was not very good in comparison to other top flights. The rest of the French team also had trouble in getting long flights. Our friend, Mr. Desnoes, thought that the propellers might be a bit too large, especially since their diameter was more or less carried over from lighter jobs. So he suggested that they cut the diameter down a bit.

(Continued on page 62)









**1/8 RUBBER  
STRANDS 28  
LENGTH 46"  
TURNS 850**

ANCHOR PIN HOLES  $\frac{1}{8}$ " DIA. FOR NINDING

**WEBER (FR.) FREEWHEELING**

SW/0

BEASS!



1

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## WEIGHTS

FUSELAGE 40 grams 1.31 oz.

WING 30 - 1.05

TAIL	25	.80	71
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PROP 30 " 1.05 0

RUBBER 88 " 3.10

LANDING GEAR 15 " .53

TOTAL	2289	7.84
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APPROXIMATE

TOTAL = 22841 x .0353 = 8.

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LOADING RUBBER TENSIONER

APPROXIMATE

TRUE TOTAL = 22841 x .0353 = 8.0484 OZ.

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—A PERSONAL GIFT FROM CLARK GABLE—CONSISTING OF A FLYING SUIT SIMILAR TO ONE IN THE PICTURE.

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### THE RULES ARE SIMPLE

1. Anyone can enter except Model Airplane News and Metro-Goldwyn-Mayer employees.

2. There is no entry fee. Send, or take, your essay to "Test Pilot" Contest, Model Airplane News, 551 Fifth Avenue, N.Y.C., or M.G.M., 1540 Broadway, N.Y.C.

3. The contest is open now and closes September 1st, 1938.

4. Essays will be judged for originality and neatness. The decisions of the judges will be final.

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1st and 2nd Prizes will be 2 Free Round Trips via the American Airlines Flagship and will include free hotel accommodations, meals and transportation necessary to reach airports, Hollywood and the M-G-M Studios and return.

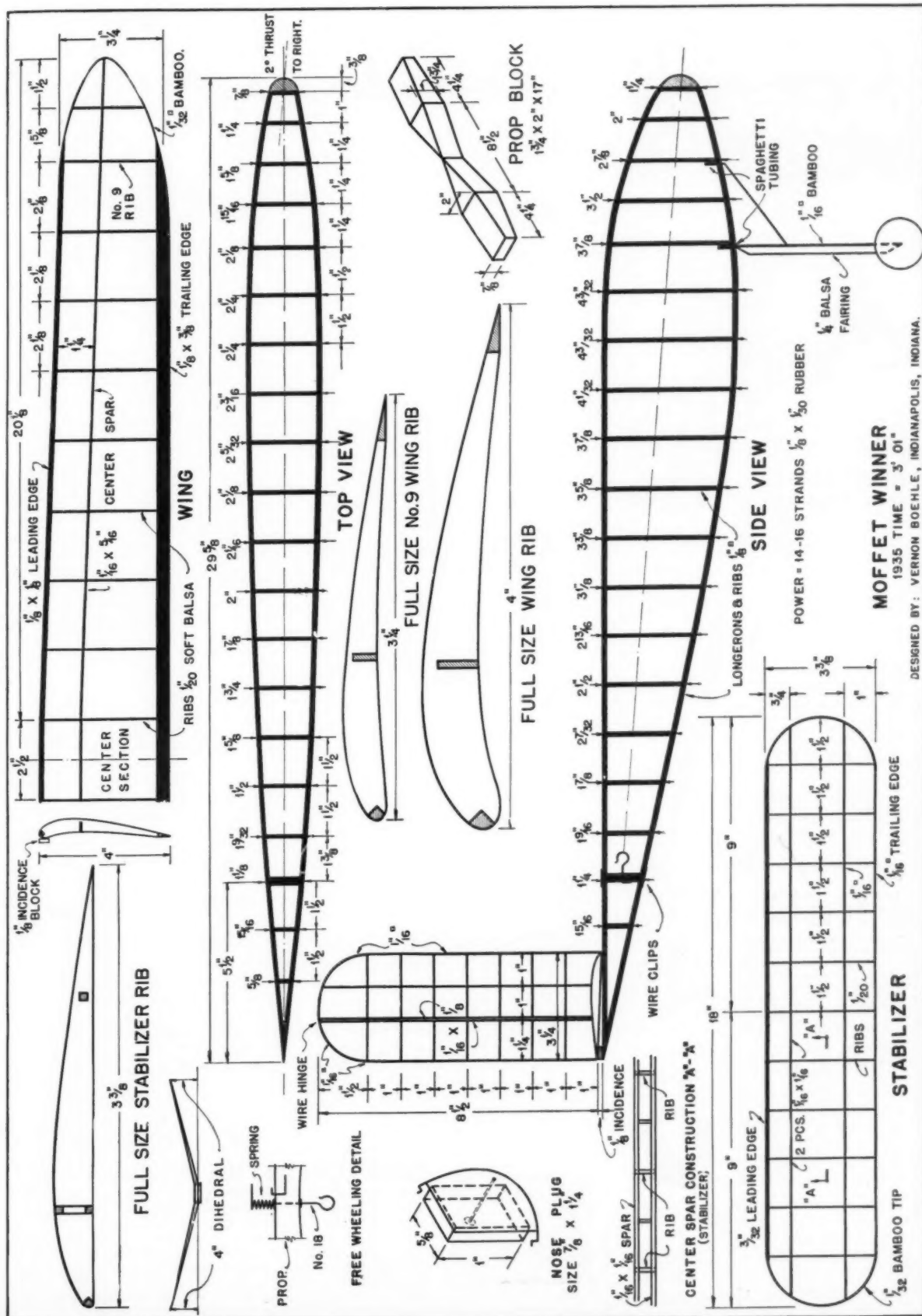
### A \$250 CUSTOM-BUILT PILOT RADIO IS THE 3rd PRIZE!

A magnificent radio machine has been contributed by the internationally-known Pilot Radio Corporation. It will constitute a Third Prize to be awarded in this National "Test Pilot" Essay Contest.

### Judges for the National "Test Pilot" Essay Contest Are

Clark Gable, Victor Fleming, Spencer Tracy, Louis D. Lighton, Wm. R. Enyart—N. A. A. Contest Board, Major General Oscar Westover—Chief of Air Corps, Col. Alexander P. deSeversky and Major James H. Doolittle.







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in 10 years



**Remington  
NOISELESS  
Portable**

Now 10c a day

**10c  
A  
DAY**

Imagine a typewriter that speaks in a whisper! You can write in a library, a sick room, a Pullman berth, without disturbing others. And superb performance that literally makes words flow from the machine. The Remington Noiseless Portable is equipped with all attachments that make for complete writing equipment—it manifolds and cuts stencils perfectly. Furnished in black with chromium fittings.

## SPECIFICATIONS

Standard keyboard. Takes paper 9.5 inches wide. Standard size, 12 yard ribbon. Makes up to 7 legible carbons. Back spacer. Paper fingers. Roller type. Black key cards with white letters. Double shift key and shift lock. Right and left carriage release. Right and left cylinder knobs. Large cushion rubber feet. Single or double space adjustment. A brand new NOISELESS typewriter, right off the assembly line.

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For the first time in history you can own a genuine Remington Noiseless Portable for only 10c a day or \$3.00 a month. Think of it! The finest Remington Portable ever built at the lowest terms we have ever offered.

And you don't risk a penny! We will send this brand new Remington Noiseless Portable for a TEN DAYS' FREE TRIAL! If you are not satisfied, send it back. We pay all shipping charges.

## FREE TYPING COURSE

With your Remington Noiseless Portable—absolutely free—a 19-page course in typing teaching you the Touch System, always used by experts. With the help of this course you will find typing the most enjoyable way you ever wrote.



## FREE CARRYING CASE

Under this new purchase plan you also receive a FREE Carrying Case, handsomely covered in DuPont fabric. The case makes it easy to take your machine anywhere. You can use it on trains, or on your knees at home. Don't delay. Mail the coupon.



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465 Washington St., Buffalo, N. Y.

Please tell me how I can get a NEW Remington Noiseless Portable Typewriter, plus a free typing course and carrying case, for only 10c a day. Also send me an illustrated catalog.

Name.....

Address.....

City..... State.....

## The Plane On The Cover

(Continued from page 31)

space, linen closets, cup and plate racks, a built-in hot table and rows of both hot and cold thermos containers. These meals will be carefully planned and cooked according to the recipes of Transcontinental & Western Air's new world famous chef, Michael.

The Boeing "Stratoliner" model 307 has a gross weight of 21 tons, a wing span of 107 feet, 3 inches, and is 74 feet, 4 inches long. Construction is all-metal throughout with the exception of the control surfaces which are fabric covered. The tail surfaces are all cantilever in design. These, and the ailerons as well, are aerodynamically balanced and further efforts to minimize control efforts on the part of the pilot have been included in the metal trimming tabs on all surfaces. The cantilever wing is of the famous Boeing combination, truss and stressed skin construction, and has an area of 1,485 square feet. They are completely equipped with electrically operated flaps which bring the ship in to a 70 mile per hour landing, considered completely within the requirements of safety for the large landing wheels. The main landing gear as well as the tail wheel are retractable by electrically operated mechanism. Special safety devices lower these automatically and lock them when the ship falls under a specified altitude.

Power, and plenty of it, is supplied by four Wright "Cyclone" nine cylinder radial, air-cooled, model GR-1820-G102 engines, supplying 1,100 horsepower per unit. Thus, a total of 4,400 horses are available, considerably more than found in a modern locomotive. Special exhaust collector rings and dampers deafen the exhaust noises to an appreciable degree. Power is transmitted to the air by four three-bladed, full feathering, constant speed Hamilton Standard Hydro-feathering propellers. These airscrews are fast becoming standard equipment for engines in the vicinity of 1,000 horsepower and over.

Tankage for 1,275 gallons of gasoline and 100 gallons of oil is provided, which gives the ship a cruising range, at average speed, of almost 2,000 miles. However, should fast schedules demand as high as a 215 mile per hour cruising speed, the range is cut to 1,475 miles. Top speed for the Boeing 307 is 241 miles per hour at 6,000 feet. However, it is estimated that the "Stratoliner," when equipped with supercharged engines and flying at its service ceiling of 23,300 feet, will attain a top speed of almost 250 miles per hour. It will climb 1,250 feet per minute with all four engines, and, amazingly enough, can actually climb 200 feet per minute with ANY two engines, a mark of sheer genius of aeronautical design.

The sub-stratospheric qualities of the Boeing "Stratoliner" model 307 make it especially unique. The cabin is completely sealed at any altitude up to 12,000 feet and this pressure maintained throughout the climbing range. Thus, at 12,000 feet, the cabin may be closed, imprisoning an air density of 10.2 pounds per square inch. The ship continues to climb to its 20,000 feet level where the density is only 6.7 pounds per square inch, or small enough to render a passenger unconscious.

Although this represents a pressure differential of only 3.5 pounds per square inch, the cabin has been designed to withstand a differential of as high as 6 pounds per square inch, giving it nearly a one hundred per cent margin of safety. Oddly enough, the sealed air in the cabin is circulated, washed, heated and conditioned while in flight through specially designed vents in the leading edge of the wings. There are two separate and distinct mechanisms for accomplishing this, one electrical and another mechanically operated. This functions automatically, drawing the fresh air in through the ducts, compressing it by two engine-driven superchargers, heating it by freeze-proof steam radiators of the condenser type and then circulating it through the cabin. This is then exhausted through special conduits on the lower deck. Outside caps are provided so that air may be conditioned from a special portable apparatus on the ground preparatory to the take-off.

When coming down from the sub-stratosphere the ship may drop at the rate of 565 feet per minute while the pressure inside is regulated so that the net effect on the passengers is a drop of only 300 feet per minute. Thus, valuable time is saved and passenger comfort is unmolested.

The first pair of Boeing "Stratoliners" will be completed this summer and will go into service over Pan American Airways' Florida-South America routes. Six are then scheduled for delivery to Transcontinental & Western Air, who have switched their interest from the Douglas DC-4, and another for Pan American without the supercharged feature.

Before closing we feel compelled to describe an alternate arrangement of the "Stratoliner" cabin for executive use. Should a wealthy purchaser feel so inclined he may invest in the 307-A Club Car model in which there is a lavishly furnished living room with lounging chairs, a buffet, a long-wave radio for program reception, Venetian blinds and indirect lighting. The master's suite has a curtained-off bedroom adjoining and in the rear are situated the GUEST ROOM, kitchen, shower baths and dressing rooms. And ancient Pharaoh could imagine nothing nearer Paradise than such a modern flying miracle.



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IN  
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## NEVER BEFORE ON THE AMERICAN MARKET

A 10-drawer ALL WOOD cabinet. Each drawer one inch high inside, four wide, five deep. Built of SOLID WOOD, NOT VENEER, Casco glued, pinned and fine sanded. Ready for stain or enamel. For years you have been looking for one single receptacle in which to keep the many things—that may now be in cigar boxes, glass jars, etc.

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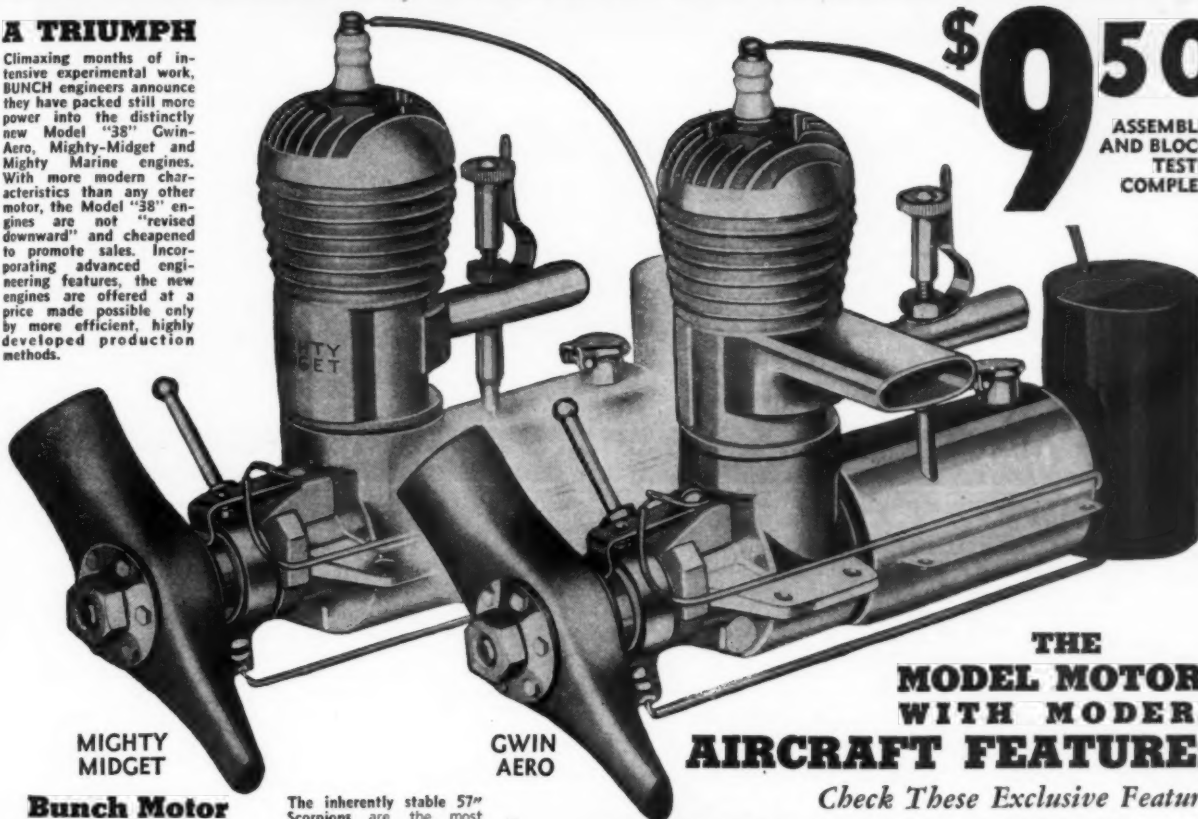


# new BUNCH '38' MOTORS

## A TRIUMPH

Climaxing months of intensive experimental work, BUNCH engineers announce they have packed still more power into the distinctly new Model "38" Gwin-Aero, Mighty-Midget and Mighty Marine engines. With more modern characteristics than any other motor, the Model "38" engines are not "revised downward" and cheapened to promote sales. Incorporating advanced engineering features, the new engines are offered at a price made possible only by more efficient, highly developed production methods.

**\$9.50**  
ASSEMBLED  
AND BLOCK-  
TESTED  
COMPLETE



MIGHTY  
MIDGET

GWIN  
AERO

## THE MODEL MOTORS WITH MODERN AIRCRAFT FEATURES

### Bunch Motor Guarantee

Every Bunch Engine is equipped with a modern lightweight piston and accurately fitted piston rings. Your engine is not only guaranteed to perform perfectly when first received, but will actually build compression throughout its entire life. Bunch engineers have found, after much research, that piston ring construction, as developed for these engines, will outrun and outlast motors of any other design.

Why Buy an Engine of 1910 Design When, for Less Money, You Can Own an Engine with These Latest Aircraft Features?

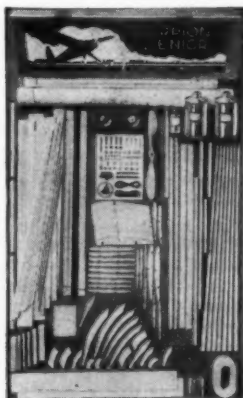
The inherently stable 57" Scorpions are the most popular design on the West Coast. Every detail of construction explained. Also a

full lesson in gas model flying. Every part accurately cut out, factory finished. Autoknips flight duration timer, 3 1/2" pneumatic wheels.



### SCORPION SENIOR

THE "INVERTED"  
GAS MODEL



Master Kit—as pictured...\$10.50  
Standard Kit—less wheels, timer, wiring, prop, shaped cowling...6.95  
Special Kit (less chemicals)...4.95  
Plans and Instructions only...50  
For Upright Engine, order Scorpion Major kit.

### Check These Exclusive Features

**One-piece Modern Aircraft Cylinder:** Trouble and leaks found in the cylinder construction of other motors are absent in the Model "38".

**Micro-Metal Machine Cast Crankcase:** Superior machine casting process, using new "Micro-metal" aircraft alloy.

**Pressure Lubrication through Hollow Drilled Crankshaft:** adds several hundred r.p.m. to the top motor speed. The only model engine with a crankshaft drilled expressly to provide flowing film of oil at main bearing.

**New Reversible "Marcel Locking" Timer System:** A marcel spring insert positively locks timer in any position from full advance to full retard.

**Micrometer Type, Spring-Locked Needle Valve,** "jitter-proof," locks the needle against movement from vibration as found in impractical "push-pull" systems.

**"Square Section" Piston Rings and Hi-Dome Piston:** the same type rings used on the super 1,000 h.p. Twin Row radial aircraft engines.

**Specifications:** All Bunch Engines full 1/5 h.p. 5200 r.p.m.; 1/4 h.p. 8500 r.p.m. Bore 7/8", Stroke 13/16", Bare Weight 6 1/2 oz. Complete, ready to run, with coil, condenser, fuel tank and Champion spark plug.

MIGHTY-MIDGET Upright Assembled \$ 9.50  
MIGHTY-MIDGET Upright Kit . . . 7.85

MIGHTY-MIDGET Inverted Assembled 9.75  
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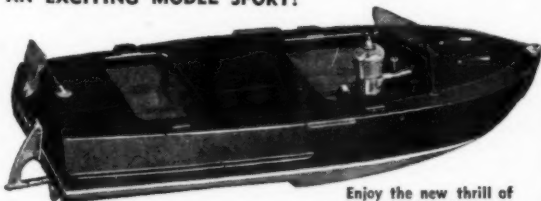
GWIN-AERO Upright Assembled . . . 12.00  
GWIN-AERO Upright Kit . . . 9.85

GWIN-AERO Inverted Assembled . . . 12.50  
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MIGHTY MARINE Assembled . . . 12.50  
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## SEA HORNET SPEED BOAT AN EXCITING MODEL SPORT!



Enjoy the new thrill of high-speed model boat-ing. Build the 24" Sea Hornet speedboat from cut-out and finished parts: frames, keel, stern, transom, motor mount, driving mechanism, etc. Master Kit—Nothing to buy but the engine...\$11.50  
Special Kit—All finished parts as in Master Kit, less only cement, dope, fabric, wiring, and propeller drive. Stuffing box and other fittings furnished...7.50  
Full-Size Drawings, patterns and instructions...50

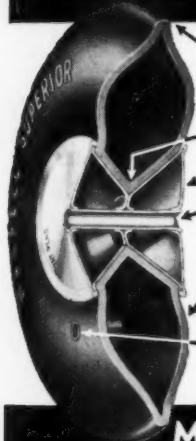
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# MARPELL WORLD'S FINEST STREAMLINED GAS MODEL WHEEL



*No other wheel has all these patented features:*

- **Raised "Wear-Ever" Tread.** Narrow ground contact prevents "ground-looping" . . . assures streamlined shape at full air pressure.
- **Full Diameter Pneumatic Cushion.** Fifty per cent more resiliency with shock absorption right to the very axle.
- **New Patented Duralumin Hub.** Fabricated all-metal hub, of conical shape, saves weight and can not rim cut. Polished to a bright chromium finish.
- **Long-Life Bronze Bearing.** Reduces friction . . . prevents wear and binding for entire life of wheel.
- **Finest Grade Ebony-Finished Rubber.** Smoothly vulcanized to an even .072" wall thickness . . . black satin finish not affected by heat or cold.
- **"Air-Check" Inflation Valve.** Holds full pressure indefinitely . . . valve is flush with tire . . . inflates with ordinary tire pump.

This new, no-leak, patented "Air-check" inflation valve is guaranteed against defect. Entirely original in design, this valve will not leak by outside manipulation or on landings. To regulate pressure, a simple adapter that fits any tire pump is furnished with each pair

Your choice,  
4 1/2" diam., wt.  
4 oz. pr.; or 3 1/2"  
diam., wt. 3 oz.  
pr., either size.

Per pair . . .

**\$2.00**

Post paid in U.S.  
California Buyers  
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Sales Tax.

## ORDER DIRECT FROM FACTORY

We have eliminated dealers' discounts and made possible this attractive price. Send postal money order. Please do not send checks.



**MARPELL SUPERIOR PRODUCTS CO.** 6406 Victoria Ave., Los Angeles, Calif.

**FREE Sensational OFFER**  
**2 FENCING SWORDS FREE**  
**FENCING**  
**WORLD'S FINEST SPORT**  
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Develops strong body and alert mind. **HARMLESS.** The spring-steel 3-foot-long foils (swords) are equipped with rubber buttons. Aluminum cup-shaped hand guards. Our De Luxe foils are built for hard usage.

Complete set of two foils (swords) and free instruction booklet, only \$1.99 postpaid. Two additional fencing swords **FREE** for limited time. (Regular price of these two sets of foils \$3.96.) **ORDER NOW.**

**ALL-AMERICAN FENCERS GUILD**  
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Pioneers in Power Plane Promotion  
Present Preferred Products for  
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CONTEST TIMER**

Just Out! This new tiny "ship saver" weighs under 1 oz. Is your insurance against model loss. Vibration proof, exact, rugged and minute. Has built-in snap action switch. Adjustable 0 to 45 seconds. New affixed mounting screws.



**COMPULSORY FOR CONTESTS  
SAFE FOR SPORT**

De Luxe \$2.50 Standard 1 1/2 Oz. \$2.00  
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**DEALERS**—Here's the hottest item of the year. You can buy and sell it profitably from POLK'S. **BUILDERS—READY AT LAST!** The most complete, money saving almanac in the gas model field. Send for yours to-day. Only 5c.

**POLK'S FOR POWER PLANTS**

421 Seventh Ave., (33rd St. Entr.) New York City

## Frontiers of Aviation

(Continued from page 17)

graceful lines, and it may be their next development. It is single-hulled and powered by four engines (radial) in the leading edge of the wing. The nose is round with the crew sitting well up in the bow like the new French S.E. 200. There is only a single rudder and the wing fairings into the top of the two-step hull. The steps are rather far aft and close together.

While there is some talk that American Export Airlines will use Consolidated PBV flyingboats to commence preliminary operations across the Atlantic to the Mediterranean, Consolidated Aircraft has submitted a bid to Pan-American Airways in response to their recent request. It is for a 195 foot flyingboat weighing 176,000 pounds fully loaded. The Consolidated ship will be single-hulled.

While Short Brothers have added approximately 8,000 pounds gross load to their latest Empire boats for trans-Atlantic use, they are also developing an 80,000 pound boat! But from there England steps way down to the DeHavilland 12-20 place twin-engined plane as her forthcoming new big commercial venture.

From the S.E.C. we hear that the Interocean Dirigible Corporation has been formed to build a ten ton, 40-passenger airship to compete with the proposed flyingboats. It will be about 400 feet in length.

Do not look now, but Martin is building one of those flying dreadnaughts for the U. S. Navy that is larger than the Sikorsky and Consolidated creations. We understand the order has been placed to the tune of about \$800,000.

Enough for the big flyingboat . . . and here is some news on Howard Hughes. It is a known fact that he has given up his trip around the world, as whispers have it that he needed something faster than a Sikorsky S-42; which may be true. We hear he is going to use a Lockheed 14 in its stead!

From a "secret service operator" of

ours we hear that Vultee will come forth with a ship with flush plating and flush rivets known as the V-12. The crew enclosure will also be redesigned slightly from that on former Vultees. This same person also brings the thought to our mind that with Mr. Richard Palmer, designer of Hughes' racer, and head of the Vultee "stick-slippers," new designs will naturally be forthcoming with the Palmer touch to them. He may once more launch into the twin-engined pursuit design which we mentioned about a year ago as being in progress.

At Lockheed we know a bomber is under way along the lines of the Model 14. It would certainly look sleek with Allison engines, and is a good possibility. Lockheed is said to be thinking in terms of many new designs these days.

Watch in these columns shortly for the announcement of a new racing plane.

The aircraft show at Los Angeles from April 2nd to 10th was perhaps not as interesting to the aviation enthusiast as it might have been, but it provided the general public with an educational tour of aeronautics that should have its effects on the industry. Most all the sportplanes from the Piper Cub to the Fairchild "45" were on display. All were the new 1938 models with all the added details to capture more purchasers. The new Rearwin Speedster made its first public appearance on the west coast. The new Stinson was present with a refined cowl and altered windshield. Then there was the new low-wing sportplane designed by Mr. Dale and called the Air-Dale. It is a two-place tandem open cockpit plane powered by either a 40 or 50 hp. engine. Thus we have a low-wing ship among the ranks of our lightplanes. It is a rather sleek looking plane and sells for about \$1,600.

Art Chester's "Jeep" put in an appearance and next to it was the wing of his new racer, now being built. It is a two spar all-wood wing about the same size as the one on "Jeep," with the front spar "beefed" up to carry a very substantial load. Being of moderate taper it will be full cantilever and in one piece from tip



# OHLSSON

## POWERS THE CHAMPIONS



**Ohlsson Gold Seal Miniature Motor.** Has powered more winners in every California Model Meet in the last two years than all other motors combined. **\$18.50**  
Factory tested and guaranteed

**Ohlsson Pacemaker California Champion.** Has taken more prizes and won more California Model Meets than all other designs combined. Complete kit for building this sensational performer. **\$10**

**W**INNING three of the first five places, and scoring more points than all other makes combined, Ohlsson Gold Seal Miniature Motors and Ohlsson-powered Pacemakers practically stole the show at the San Diego, California, Model Meet on Sunday, April 24.

In a field of over two hundred entrants Ohlsson Motors were predominantly the favored power plant, and Ohlsson-powered Pacemakers the winning ships—a performance which Ohlsson has duplicated in every major model meet in California for the past two years.

The championship performance of Ohlsson Gold Seal Miniature Motors is an accepted fact by model fans *who know* motors. They know that Ohlsson motors are carefully built engines—that all parts are made from the finest raw materials and finished to the closest allowable tolerances. In addition, every Ohlsson Gold Seal Miniature Motor is placed on a testing block, thoroughly run-in, and checked for any possible defects.

One thing you may be sure of—when you power your model with an Ohlsson you are getting the finest miniature motor the market affords—honestly built and honestly priced!

**OHLSSON Powers the CHAMPIONS!**

### COMBINATION OFFER

You save \$3.50 if you order the Ohlsson Gold Seal Miniature Motor, pretested and fully guaranteed, together with the Pacemaker Kit for building the Ohlsson Pacemaker California Champion. Ready for complete assembly. All shipping charges **\$25.00** prepaid. *Only.*

### SEND THIS COUPON!

**(OHLSSON)**  
MINIATURES

630 NORTH ALVARADO STREET  
LOS ANGELES, CALIFORNIA

- ☐ Send me Ohlsson Gold Seal Miniature Motor. I enclose \$18.50.  
☐ Send me Pacemaker Kit. I enclose \$10. ☐ Send me Ohlsson Gold Seal Miniature Motor and Pacemaker Kit. I enclose \$25.

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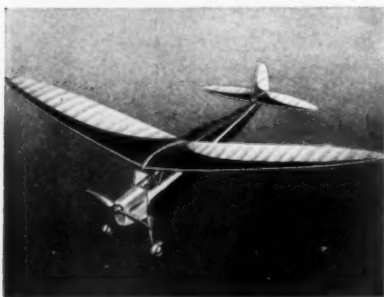
## 3 COMET HITS!



### 54" AERONCA "K"—\$1.00

Amazing stability! A real scale model, 1½" equals 1'0". Shock-absorbing landing gear, removable wings, cabin doors that open and reveal complete interior, movable controls. A "giant" in size and a "giant" in value. Kit No. P-2. Postage 15c, none if ordered from dealer.

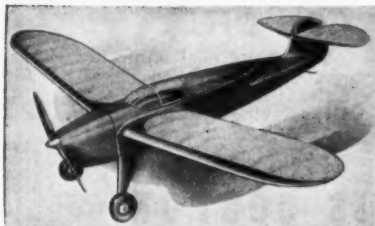
### "CLIPPER" GAS MODEL



#### Designed by CARL GOLDBERG

First and foremost designed to fly. Wingspan 6 ft., length 53½ in. Weight ready to fly, 2 lbs. 5 oz. Wing and tail detachable. Sensational new Comet automatic timer included free. Kit No. T-7—\$4.95. With air wheels, \$6.50. Postage 25c, none if ordered from dealer.

### "GOLDEN EAGLE" GAS MODEL



Especially designed for the small motor. Can be flown as high-wing, mid-wing or low-wing. Wingspan 45 in., length 32½ in., weight ready to fly 1 lb. DeLuxe Model, Kit No. T-8, complete with air wheels and Comet automatic timer, \$4.75. Standard Model, features identical with DeLuxe, but a few parts left unfinished—\$2.75. Postage 25c, none if ordered from dealer.

Free leaflet "How To Adjust and Fly Gas Models"

By CARL GOLDBERG, with each kit.

### BIG NEW CATALOG!

Just out—a big, new, 28-page Comet catalog, listing over 100 kits, and complete line of supplies and gas model accessories. Richly printed in two colors, profusely illustrated. 5c at your dealer.

## COMET MODEL AIRPLANE & SUPPLY CO.

2509 W. Cermak Road, Chicago, Dept. MN6  
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to tip.

Harry Crosby's all-metal racer was completed in time for its first test hop before the show. Mr. Crosby did well on the take-off but on landing the little ship ground-looped. This damaged one landing gear strut and wing tip. It will not take long to make repairs, and in the meantime the speed ship hung over Curtiss-Wright Tech's booth at the show with wheels up so no damage could be noticed. Construction is expected to start soon at the Timm Aircraft shops on Harry Crosby's proposed sportplane and perhaps a fighter adapted from his racer.

Other racers at the show were Jimmie Doolittle's and Frank Fuller's Seversky planes. The army let the public have a good look at a Douglas bomber and alongside it was a Northrop for the Argentines. Of wartime vintage was a real Spad which Paul Mantz recently flew during the filming of that new air epic, "Men With Wings." Incidentally Mr. Mantz has completed the rebuilding of a Lockheed Orion, improved in many respects, and is all set to take the lead in this year's Bendix air race. There is 710 hp. up in the nose.

Mr. Waldo Waterman has been thinking in terms of flying tanks these days and announced during the aircraft show that he has one designed which would sell at \$6,000,000 per 1000. They would be an enlarged version of his Arrowbile pushed by a Menasco Super-Buccaneer engine. The ships would fly across the enemy's lines, and if their wings were not blown off enroute they would be dismantled on the ground. Then the craft would attack on the ground. Armor plating in the nose would prevent the two-man crew from being riddled with bullet holes. Guns would be located in the nose and amidship with a reversible pitch propeller, so the crew could back up if the battle got too hot for them. The nose wheel is steerable by the control column. Top speed is 200 m.p.h., cruising 160 m.p.h. and on the ground the tanks can reach 70 m.p.h.—a bit uncomfortable when skimming over shell holes we should say. Twenty-two thousand feet is its maximum ceiling with a range of 750 miles; 560 pounds of armament may be carried. Length: 14' 4"; span: 37'. One good point about these Waterman flying tanks is that a great quantity could be stored in the hole of an aircraft carrier with wings dismantled. Wings may be put on in a few minutes and the ships would be all ready for battle.

As we predicted in past issues, Germany has made a bid for aircraft export and thus many German airplane advertisements are appearing in American publications. Germany was even interested in showing some of her products at the Los Angeles show but for some reason they did not show up.

In the neighborhood around Pasadena some men are very seriously considering building a large factory to produce sportplanes in quantity. They have considerable money behind them and will be a threat to the lightplane industry. Their first plane in prospect will be an all-metal, two-place, 50 horsepower job to sell for about \$1,500.

The Criley Aircraft Industries have developed a small airplane starter for the lightplane. This would be especially suitable for a light amphibian or sea-plane when, and if, a successful one is ever built. The whole trouble is that there is no place to stand without having to dive into the water after each heave of the prop. This would be rather an ordeal on a cold morning when the engine refused to run. The engine starter would come in handy, but then there are many other troubles that must be conquered before a sea-going lightplane is perfected.

The latest Babcock-Vlcek is a cabin version of the former one with a Cirrus engine of 90 hp. Top speed is 115 m.p.h., cruising is 100 m.p.h., and landing speed is 35 m.p.h. Tail surfaces have also been redesigned.

Abroad we see that the new Junkers Ju. 87 two-place low-wing dive bomber has been completed. It is powered by a Jumo 680 hp. engine with flaps for decreasing its speed in dives. They have been doing much experimenting with reversible pitch propellers and flaps abroad, but it may take even more than that to slow up future bombers when in the dive.

In Russia we hear of a new 1200 hp. engine designed by Mikulin. The first of the Seversky amphibians for the U.S. S.R. has been completed.

We hear that the Canadian Car and Foundry Co. has contracted with the Mexican government to manufacture planes in Mexico, and when finished they may be no other than the American designed Grumman. The humorous part is that it is possible they will be used in one of the foreign wars and thus is one round-about way of an American ship getting to the foreign battlefield.

## "THE MODEL BUILDERS BIBLE" 1938 MODEL AERONAUTICS YEAR BOOK

Written and Edited by Frank Zaic

● Completely new in every respect. New simplified Low Speed Aerodynamics. New and vivid explanations of all stability problems. New ideas in construction, finishes, gadgets, experiments and future designs.

### 110 DETAILED PLANS COVER THE WHOLE MODEL FIELD!

● 26 Gas designs, 18 Wakefields, 15 cabin jobs, and 51 more plans include, Stick, Rockets, Autogiros, Ornithopters, Helicopters, Towline and Hand Launched Gliders and complete array of the latest indoor designs.

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MODEL AERONAUTICS PUBLICATIONS 83 East 10th Street New York, N. Y.



There is also a story that American Airlines may purchase Northwest Airlines, but the probable outcome will be that Northwest will "cop" American's Chicago-New York route, and then we may see Northwest in the market for some big four-engined transports or maybe the new Curtiss planes.

"Aviation" calls our attention to the new Barlow bomb being tested by Martin, a new bomb for the airplane.

Remember when we told you many months ago, a very many months ago, that Douglas is going to build a bomber with the DC-4 as its prototype? Well, we still stick to it!

*Dornier DO-18 Breaks World's Long Distance Record. Junkers-Diesel Aero Engine "Jumo 205" Is Successful*

On March 27, 1938, at 10:15 Central European time, the Dornier flying boat DO-18-ANHR started from the British coast, near Plymouth, to attack the existing long distance record of the world for seaplanes. The chosen route led from the south coast of England across the South Atlantic to South America. The attempt succeeded. The previous record over 7020 km of the Italian Stoppini was surpassed by about 1400 km during this flight, the distance covered by the German flying boat being about 8400 km. The watering took place on March 29 at 10:05 Central European time, in the bay of the Brazilian town of Caravellas.

Considering the various international efforts for the development of the transoceanic flying service this very record is of special importance, for it proves that Germany does not only dispose of crews well-trained in transoceanic flights but still commands with her flying boats a leading position in the construction of seaplanes.

The attempt at the world's long distance record gains special importance by the use of Diesel aero-engines. Germany possesses in her Junkers-Jumo 205 the only Diesel engine of the world which has already proved its efficiency in the postal flying service. New Junkers succeeded in a still further reduction of the already very low fuel consumption of this engine. The consumption of only 155 grams per hp. an hour, not yet attained by any aviation engine of the world, represents a record by itself.

The Dornier-flying boat D-ANHR was equipped with two of these Junkers-Diesel engines of the latest design.

Its success in increasing the world's long distance record, up to now held by the Italians with 7020 km, by 1400 km up to 8400 km, was solely possible by the low fuel consumption of the Junkers-Diesel aero-engine, the advantages of which showed up fully during this flight.

The world's long distance record of the DO-18 with Junkers-Jumo 205 is again a proof of the correctness of the development tendencies to create a reliable Diesel aero-engine, as pioneered in Germany by Junkers and carried on for years in persevering test work. A French engine expert rightly says considering the flight: "The Germans, who have been working for many years on the difficult problem of the Diesel engine and who were the first to manufacture such an

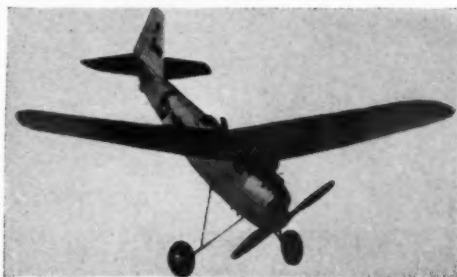
## MODEL CRAFT Value of the Month

### NEW FLIGHT TIMER



**\$1.25**

Adjustable from 1 second to 1 hour. Weight  $\frac{1}{8}$  oz. Accurate, reliable. Complete to drilled mounting holes. Ready to attach wires and install in ship. The first dependable timer made just for models.



### THE NEW 1938 SCOUT

A Big Ship For Powerful Flying Powered by Midget, Denny-mite, Cyclone, Ohlsson or Brown engine. The Scout is new throughout with 60" tapered Clark Y wing, new design, and parts with latest improvements. Kit contains formed landing gear, ready-cut ribs, formed face plate and cowl, switch, hook up wire, cement, dope, silk, full sized plans and Vuit air wheels. Only **\$7.25**

Special money saving deal; Kit, Timer and Ohlsson engine **\$25.00** ~~\$22.50~~

Same kit with bamboo paper and rubber Donut wheels **\$4.85**  
Dry Kit: No cement, dope, covering or wheels **\$3.75**

### THE PACIFIC ACE



This graceful, high-flying, light-weight ship is very popular this season. Kit is fully equipped, including ready-cut ribs, beveled trailing edge and real silk. Power with Brown, Ohlsson, Cyclone, or Denny-mite engine. Weight ready to fly, 3 lb. 4 oz. **\$8.50**

Price prepaid in U. S. A. Same kit less air wheels, silk, cement & dope **\$4.75**

### THE FALCON



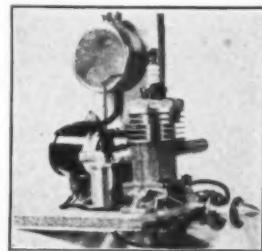
POWER WITH BRAT, TROJAN, HUSKY, ELF OR CHUNN ENGINE. Boys, here is the plane for you. Easy to build, and flies smooth as a Gull. 38" tapered wing. Kit complete with cement, dope, wheels, covering, printed ribs, formers, etc. **\$1.50**

Deluxe kit with Traxler air wheels and silk covering **\$2.95**

## MODEL CRAFT

7306 S. Vermont Ave., Dept. B, LOS ANGELES

—THE LEADING SUPPLY HOUSE OF THE WEST—



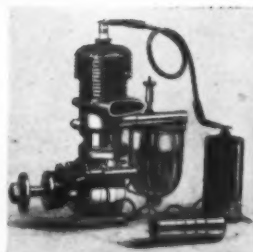
**HUSKY JUNIOR**  
**\$12.50**

At last, a powerful lightweight engine at a price you can afford to pay.  $\frac{1}{2}$ " bore,  $\frac{5}{8}$ " stroke, 4 oz. weight, and 250 to 10,000 R.P.M. New, float type carburetor. Only \$12.50.



**MIGHTY MIDGET**

Kit **\$7.85**  
Especially adapted to the Scout



**1938 OHLSSON ENGINE**

**1 1/8 H. P. \$18.50**

A high-powered unit

### SOGARD PROPELLERS



**49c**

9", 12", 13", 13 1/2", 14"

Yes, this same high-quality Sogard Propeller is sold at an amazingly reduced price. It is the prop with true pitch, accurate balance, maximum thrust and minimum torque. Take advantage of this sensational offer. Order today!



# The New SELLEY "BULLET" REDI-TO-FLY

Boys! Now you can enjoy the thrill of flying your own model without going through hours of messy construction. This marvelous new Selley "BULLET" comes to you completely finished and ready to fly! NOTHING TO BUILD, no complicated plans to follow. FLY IT ONE MINUTE AFTER YOU BUY IT!

Sensational value—30 inch wing span! True-life appearance—authentic detail down to the last rib and spar! Phenomenal strength—one-piece moulded crash-proof fuselage and moulded puncture-proof wings! Ultra-modern design—finished in seven brilliant colors with regulation U.S. Army insignia . . . super streamlined from nose to tail!

Compositely patterned after the latest U.S. Army Pursuit Type plane, the new "BULLET" will thrill you with its speed, stamina, and sensational flying performance. Be the first in your neighborhood to fly this graceful new super-speed model. If your dealer can't supply you, send money order plus 15c for postage.

**COMPLETE! READY TO FLY!**

**SELLEY MFG. CO., INC., DEPT. 307 1373 GATES AVE., BROOKLYN, N. Y.**

**NOTHING TO BUILD—FLY IT IN  
One Minute!  
30 INCH WING SPAN**



**\$2.00**

15c Postage  
west of Miss. 25c

Postage 3c per item. Orders  
over \$1.50 10% off order  
for postage. Send 5c for  
Complete Catalog.



**DEALERS:** Write for confidential list.  
LOWEST PRICES  
ANYWHERE

**STOCK ANCHORS**  
White metal  
1/8" 5c  
3/16" 10c  
1/4" 20c  
5/16" 25c  
3/8" 30c  
10c extra for at-  
taching shackles.

**NAVY ANCHORS**  
3/8" 5c  
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**Old Style ANCHORS**  
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1/2" 10c  
5/8" 15c  
3/4" 20c  
1" 25c

**CANNONS**  
White metal  
1/8" 10c  
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**Blocks**  
Boxwood  
All sizes  
1/8" 10c  
1/4" 20c  
1/2" 40c  
2" 50c

**Blocks each up to 1/4"**  
SINGLE 25c  
DOUBLE 35c  
TRIPLE 45c  
Stripped 2c extra,  
20c off on 50 of a size.

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White metal Right or Left  
3/16" dia. 10c  
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**VENTILATORS**  
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Cowl Pipe Price  
3/16" 3/32" 05c  
3/8" 1/8" 05c  
1/2" 1/4" 05c  
5/8" 3/16" 10c  
3/4" 1/2" 10c  
1" 5/8" 10c  
1 1/8" 1 1/2" 10c  
1 3/8" 1 3/4" 10c

**LIFE BOATS**  
Type A boat with double  
pointed ends.  
Type B square stern.  
Wh. Metal Selley-Tex  
Featherweight

**Dead Eyes**  
Natural  
All sizes 10c pr.  
some as low as 5c  
2 1/2" up to 1 1/2" 25c pr.  
2 1/2" up to 1 1/2" 25c pr.

**DAVITS**  
for above  
boats  
1" 10c pr.  
2" 15c pr.  
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2 1/2" up to 1 1/2" 25c pr.

## EASYBUILT

(CANADA)

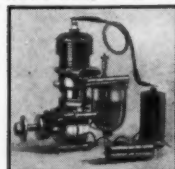
Presents 4 New 18" Flyers, Ea. **25c**

Post. 5c extra in foreign mailing tube



Top left, Howard DGA-9  
Bottom left, Cessna  
Top right, Stinson Reliant  
Bottom right, Taylor Cub

**KITS CONTAIN EVERYTHING**  
Balsa; Plans and Photo-  
graphs; Colored Tissue;  
Printed Silhouette Sheet  
Balsa; Special Brown Rub-  
ber; Wing Numbers; In-  
strument Panel; Special  
Dished Nose Bearings; Gen-  
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structions; Movable Controls.

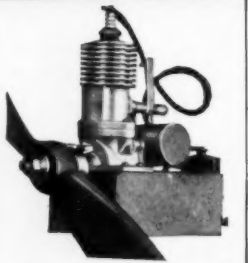


**1938 OHLSSON  
GOLD SEAL MOTOR**  
We are pleased to announce our ap-  
pointment as sole Canadian distribu-  
tors for the New 1938 Ohlsson  
Gold Seal Motor. Literature on re-  
quest. Orders filled immediately from  
stock. Liberal trade-in allowance on  
your present motor.

We would like to have you on our mailing list. Write  
us whether interested in Gas or Rubber Powered Models.  
**THE EASYBUILT MODEL AEROPLANE CO.**  
1249 College St. Toronto, Canada

**New Better! TRY IT**

**THE  
B-B  
1/4HP  
MOTOR  
\$12.00**



**Model Motor Sensation**

This complete 1/4 H.P. Motor is guaranteed to run.  
Comes factory tested. No die cast parts—every part  
machined. Long life—instant starting—marvelous  
performance—a \$20.00 value only \$12.00. Prompt de-  
livery—postage paid anywhere in U. S. A.

**BENNETT ELEC. MACH. WORKS**  
1119 WEST LAKE ST. CHICAGO.

engine in technical perfection, are now  
just about to harvest the fruits of their  
patient labor.

The great attempt and success of this  
Atlantic crossing confirmed the value of  
the modern Diesel technique, taking a  
preferred position in the aviation of the  
world; chiefly with regard to civil avia-  
tion, passenger and freight service, and  
transcontinental long distance flights.

The crew of the record aircraft com-  
prised Flight Captain von Engel, who,  
in the service of the Deutsche Lufthansa,  
effected numerous flights across the  
North and South Atlantic; pilot Gunder-  
mann, test pilot of the firm of Dornier;  
mechanic Rösler and wireless operator  
Stein, who in the service of the Deutsche  
Lufthansa took part in many pioneer  
flights.

As to the preparation and execution of  
the flight the following information was  
given:

After the preparation for this great  
flight had been quietly finished to the full  
satisfaction of all concerned, the floating  
airplane base "Westfalen" steamed to the  
intended starting place on the English  
coast near Plymouth.

The take-off took place on March 27  
at 15:05 C.E.T. After contrary winds in  
the beginning above the English Channel  
and the Bay of Biscay the flying boat  
entered, south of the Spanish coast dur-  
ing the night of the 28th of March, the  
region of the northeast trade-wind,  
which accompanied it in varying velocity  
almost to the equator. From there the  
flying boat had to overcome considerable  
side or contrary winds respectively. Dur-  
ing the last third of the flight the bad  
weather above the South American con-  
tinent developed more and more to a bad  
weather zone with ever growing contrary  
winds. On March 28 the airplane passed  
Las Palmas on the Canary Islands at  
3:30 C.E.T., Sao Thiago, an island of the  
Cape Verde group at 11:45 a.m. and  
reached the Island of Fernando Noronha  
in front of the South American contin-  
ent at 22:40. On March 29 the air-

craft flew over Pernambuco on the north-  
eastern coast of South America at 2:05  
during the night, and over the port of  
Bahia at 5:00 in the morning. At 10:15  
C.E.T. the watering took place in the  
harbor of Caravellas on the eastern coast  
of Brazil. The altitude during the flight  
varied from 10 to 400 metres. The total  
distance covered is about 8400 kilometers  
in 43 flying hours.

The crew wired the news of the suc-  
cessful execution of the attack upon the  
world's long distance record and reported:  
"Crew, aircraft and engines in the  
best of conditions."

Comradeship and assistance of the  
Deutsche Lufthansa and the Condor-  
Syndicate of Brazil were excellent in se-  
curing the success, which may be looked  
upon with pride by Dornier-Works,  
Friedrichshafen, and Junkers-Works,  
Dessau, after the recently achieved  
world records of other German airplane  
factories. The German aircraft and aero-  
engine industry can show a new world  
record. German work, German material  
and German crew were able to carry off  
a triumphal success with a normal pro-  
duction airplane.

The record flight took place under the  
supervision of sports officials of the F.A.  
I. The results of this flight will be sent  
immediately to this organization for ac-  
knowledgegment.

### How to Build a Model of the Aeronca "K"

The Aeronca "K" exemplifies the typi-  
cal American lightplane of today. A very  
realistic model may be made of this air-  
plane, and it is an especially good one  
for the beginner, as it is very simple to  
build.

Make the model entirely of balsa wood.  
Get dimensions from the accompanying  
plans. It might be well to purchase the  
wheels and also buy a tube of good color-  
less model cement. Make the fuselage  
first. Draw the outline of the top view  
and cut to shape with a saw. Be sure  
the grain of the wood is running length-



wise. Sand down sides with coarse sandpaper and then draw on the side elevation in correct position. Saw once more. Then finish up the fuselage with a sharp razor blade as shown by the cross-sections of the plans.

The wing is to be made in two sections, a left and right wing panel which will be connected to the sides of the fuselage. Draw their outlines on stock and cut. Using a sharp flat chisel shave down the wing to shape shown by airfoil section. When wing panels are finished go over their surfaces with coarse sandpaper.

The next procedure is to make the tail surfaces, which include the rudder, fin, stabilizer and elevators. Then come the wing struts, propeller, landing gear and dummy engine, details of which are sufficiently shown on plans. Go over all the parts with coarse sandpaper, and then sand to smoothness with a fine grade of paper.

In proceeding with the assembly lay the fuselage in flying position on a flat surface and join the wing with a goodly amount of cement. Block up the wing with the correct amount of dihedral and then put the wing struts in place.

When connections have dried put on the tail surfaces. Then lay the model on its back and build the landing gear complete. The dummy engine comes next and then the propeller may be put in place with a small straight pin, acting as a shaft.

Go over all connections with model cement and then sandpaper once more. Brush off all dust and begin the paint job. Colors are optional, though the majority of Aerocars are either green or yellow with black trimmings. Apply many coats to get the maximum in smoothness but do not apply a coat until the preceding one has dried. Your model will then be finished.

### Can Gliders Soar With Bird Wings?

(Continued from page 12)

The 1/7 wing has been tried out on several models, and it is difficult if not impossible to control, although the lift as shown on the chart is very high. We have found a wing of somewhat less curvature (1/10) to be controllable and to be actually capable of soaring flight when used in a model, such as the "Buzzard," a dimension drawing of which is shown herewith. Eiffel made no tests, known to us, of the 1/10 curvature but we have indicated in dotted lines on Fig. 3 the probable coefficients, based on cambers above and below 1/10. Fig. 4 shows two more sections similar to bird wings.

After testing a number of cambered wings on conventional built-up and solid sailplane fuselages representing quite a wide range of design and with many variations of stabilizer and rudder, we decided to try a closer approach to bird tail plan. The drawing of the Buzzard shows one successful form. The area of both stabilizer and fin could be considerably reduced if it were not for certain stability requirements imposed by the method of launching these soars.

Our models are flown kite fashion,

## BROWN JUNIOR MOTOR . . . MODEL D . .



This champion  
power plant...  
yours for only

**\$10**

**COMPLETE  
with coil and  
condenser**

### MODEL D SPECIFICATIONS

Bore,  $\frac{3}{8}$ ". Stroke, 1". Weight (bare)  $6\frac{1}{2}$  oz. 1/5 h.p. R.P.M. 1200 to 10,000. Height  $4\frac{3}{4}$ " (including spark plug). "Z" metal counterbalanced crank-shaft. Connecting rod of forged aluminum alloy.

Like all other Brown Junior Motors, Model D is block-tested before shipping and guaranteed against defective workmanship or materials.



**THE BROWN JUNIOR MOTORS NEW SPARK PLUG.**  
New and improved design. You'll find this the best spark plug on the market for models. It is not an adaptation of the automobile type spark plug, but a special design for model motors. It gives you a concentrated spark for easy starting. Oil free. Leak-proof. 65c

**THE BROWN JUNIOR MOTORS COIL** provides full strength spark at low speeds for easy starting. It is water-proof, oil-proof, gas-proof. Specially designed and precision built.



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**MODEL B:** Special steel cylinder and steel piston retain compression and power after motor has been run-in. Chrome-molybdenum crank-shaft, practically shockproof. Rustproof finish, \$21.50 complete.

**MODEL C:** Light weight combined with durability at the medium price of \$17.00 complete.

**MODEL M (MARINE):** This model brings to marine motors the speed and stamina characteristic of Brown motors for model planes. \$15.00 complete.

**THINK of it!** This powerful new Brown Junior Motor . . . complete, ready to fly . . . can be yours for less than you expect to pay for an ordinary motor kit!

If you're a veteran gas model-builder, this new motor will save you real money. If you have always wanted to fly a gas model, but have held back because of price—then, here's your opportunity to step right up with the best of them at a new low in cost.

The addition of the low-priced Model D makes Brown Junior Motors unquestionably the greatest line-up of motors on the market. Every model flyer can find exactly what he wants in a Brown motor.



Write now for full information on this amazing new motor! Use this coupon for a quick reply.

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- ☐ Please send me descriptive literature and details on the new Brown Junior Motor Model D.
- ☐ Please send me the name and address of the dealer nearest to my home.

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# Brown JUNIOR MOTORS

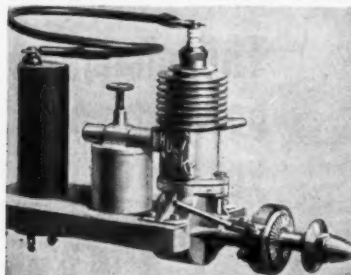


## IF YOU'RE LOOKING FOR "SOMETHING SPECIAL" YOU WILL WANT A "HUSKY" THE LIGHTEST COMPLETE READY TO RUN GAS MOTOR on the MARKET

Wt. 6½ oz. Including two pencils for Current

EVERY ESSENTIAL FEATURE and UNIQUE DEVELOPMENTS of Design with MANY NEW REFINEMENTS are INCORPORATED into this NEWEST MIRACLE in MINIATURE GAS MOTORS.

It's PRECISION BUILT—It's SIMPLE as ABC and FOOL PROOF—Can be Completely Disassembled in 45 seconds—The NEW AUTO TYPE Ignition System, using Nathan R. Smith's 1½ oz. One Pencil Coil. (no condenser needed).



Dealers Write for Special HUSKY Discounts  
Husky motor mounts, wt. ½ oz., per pr., postpaid. 50c  
Husky Non Brittle prop. 11" or 12" each, postpaid. \$1.00  
Send for list of Gas Model Supplies and Rubber Powered Contest Models. **\$12.50**

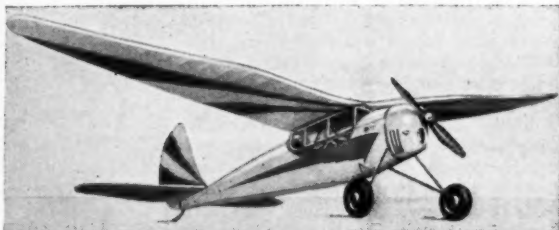
Starts the "HUSKY" QUICKLY with no effort and runs SMOOTHLY at any Desired Speed. The NEW "HUSKY" runs Equally as well Upright or Inverted and was Designed to Fly Models Weighing from 16 oz. up to 3½ lbs. The "HUSKY" will run Steadily at any Speed from 250 R.P.M. to 6000 R.P.M. using either a 11" or 12" Prop. The NEW "HUSKY" is BEAUTIFULLY FINISHED THROUGHOUT—It is BUILT to WITHSTAND any TEST It is put to—Each motor is THOROUGHLY TESTED, RUN IN and FULLY GUARANTEED to GIVE you Consistent Performance and LONG LIFE.

We are going to see to it that every HUSKY owner will be completely satisfied and a hundred per cent booster. You can't go wrong. ORDER YOUR HUSKY TODAY!

### ANOTHER TRIUMPH FOR DOUGLAS- DESIGN IN THE NEW EASY TO BUILD— "DOUGLAS E-GULL" —GAS MODEL

UNPARALLELED Stability in Flight and Glide—Motor Safety Feature—High Performance Taper Wing—Shock Proof landing gear—Detachable elevator, rudder and wing. HONESTLY, you will say that it is Easiest and Strongest Model you ever built.

You need not worry about this model doing power dives, cartwheels, making unnecessary crashes etc. The new design eliminates all these hazards—for a more stable and consistent flying model you better buy an E-Gull.



WINGSPAN 69" WT. 2½ LBS. INCLUDING HUSKY MOTOR. FULL SIZE DRAW-ING. All Wing Ribs and Body Formers Cut to Shape and Notched—Rudder, Elevator and Wing Fins Cut to Shape—Parts for Cowling—PenCell Holder—Switch—Plug & Jack—Brackets for Elevator—Strips Cut to Size—Landing Gear Shaped—M & M Wheels—Silk—Dope—Glue—Masking Tape—Celluloid Sheet—Nothing Else to Buy—Color Yellow and Red Trimming.

**DOUGLAS MODEL AIRCRAFT CO.,**

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**COMPLETE KIT** Including Silk Covering. \$8.50 (Add 35c Postage)  
Including Bamboo Paper Covering \$7.50 (Add 35c Postage)

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In order to turn out model airplanes that really fly you must know the rules of model airplane designing. If you understand the scientific principles of model aircraft you will be able to get the best performance from your models.

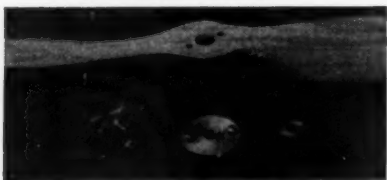
The book, "Designing Model Aircraft" will give you the exact information that you must have in order to get perfect flying models. It gives this information in a simple and ready-to-use form. Even the beginner can easily understand and use the facts set forth in this book.

Do not hesitate, send \$1.00 today for your copy of this book and start at once to turn out better flying models.

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### ATWOOD FREE WHEELER WINS 1st Place \$50 Annual A.G.M. Contest

Time: 8 min. 30 sec.  
On 35 sec. Motor Run



### Sweeping the Country

Reports show that models using these new free wheeling units are placing in the money everywhere. Will positively increase duration by adding many seconds to the gliding time of your model. You cannot afford to be without one.

Equipped with new "Weeco" propellers. Price: Now sold only as one complete unit with Special Hardwood, lacquered propeller fitted. \$2.50  
Propellers, each. .75  
When ordering, please state make of engine.



### PHANTOM SUPER-STREAMLINED SPEED BOAT

Designed by Bill Atwood.

This boat equipped with 15 c. c. racing engine, has attained a speed of 38.2 M.P.H. Will do up to 30 M.P.H. with your present marine engine.

Easily built—balsa and plywood construction throughout. Complete full-sized plans and photos. Hull only. \$1.00  
15 c. c. racing engine, detail drawings. 2.50  
Complete set of castings for above engine. 5.00  
(an ideal home work-shop project)

**AEROMARINE MODEL LAB**  
305 West Dryden, Glendale, Calif.

using 100 yards of thread with about twenty feet of rubber band at the lower end. The rubber bands are fastened to a stake in the ground. The models climb with great stability to a point directly above the point where the rubber band is fastened and then cut loose automatically or are released by taking in a few feet of slack in the rubber and suddenly releasing. The line is attached to the model by a small ring tied on the end of the string, which engages a hook on the model placed slightly ahead of the center of gravity. The position of this hook and the way it is bent is important and calls for some experiment before the best result is obtained. This method of launching models has many advantages over towing with a line alone. It is a "one man" method and the tension maintained by the rubber prevents premature launchings, common with the tow line method. The model is launched up-wind and flies back toward the point of departure, while in the tow line system the model flies away from the launching crew.

Four models of the Buzzard type are now being flown week-ends at the Fort Myers, Florida, airport and soaring flights are the rule rather than the exception. The largest of the models has a 48-inch wingspan. Aspect ratios from six to ten are represented, and the camber range is from 20/1 to 10/1. The triangular tail has become standard. Dihedral varies, in the models, from five degrees to fifteen degrees, with ten degrees seemingly about right. The dihedral must be increased with the more deeply cambered wings. These models are always tested in comparison with conventional sailplanes, of which we have quite a variety, and consistently better results are obtained with the bird-like models.

These models not only look like a buzzard but they fly like a buzzard or other soaring birds, with better maneuverability and an apparent gift of finding thermals and riding same.

The method of recovering models when they fly out of sight is quite simple. An

account of the experiments is published in the local newspaper, describing machines lost and the direction in which they flew out of sight. Hunters out after small game cover the country pretty thoroughly over the week-end, generally find the models and hesitate to keep them on account of the pitiless glare of publicity—everybody reads the paper in these small towns. Local airplane pilots are keenly interested in these experiments and have volunteered to co-operate by chasing the soaring models but so far the airplanes have all been busy on other missions at the precise time they were needed. No doubt in the near future we will have the pleasure of following a soaring model on an extended flight and this will afford us an opportunity to study the thermal currents which carry it aloft.

The ultimate object of these experiments is to simplify the soaring machine—to get away from the costly high aspect ratio tapered wings and difficult fuselage of the present day sailplane, and to more closely approach the highly efficient pat-

### AUSTIN FLIGHT TIMER

At last. A feather weight flight timer designed exclusively for gas models. Weighs only ½ of an ounce. 2½" long. Cannot jam. Accurate. The duration may be adjusted from 15 to 60 secs. Built in contact points. Easy to install.



### Only \$1.25 Postpaid Battery Boxes

Weight only ¼ ounce. For 1" diam. dry cells. Made of 17ST dural. Batteries easily replaced. Positive contact. May be moved easily for balance adjustment. 40c P.P. Pint size gas can with pump. 75c P.P. Hook-up wire, fine strand, fatigue proof. 5c per foot.

Liberal discount to dealers.

**AUSTIN TOOL & MACHINE CO.**  
1081 N. WILTON PL. HOLLYWOOD, CALIF.



tern of the buzzard, which seems to get along quite well in these parts in spite of marked differences in design from the product of the aerodynamic laboratories.

## How to Build a Pursuit Type Gas Model

(Continued from page 13)

booster plugs can be put almost anywhere where they are easily accessible.

All of the cowling that is not detachable is made by gluing planks of balsa  $\frac{1}{8}$ " x  $\frac{3}{8}$ " side by side. The entire bottom of the gull is covered in this way, as well as the upper surface of the wing between the leading edge and the front spar, the rear spar and the trailing edge. The rest of the gull is covered with silk. The cowling on the left side between stations 1 and 3 is made of one piece of medium balsa and should be made to fit carefully. It screws onto eight hardwood gussets which must be glued well to the longerons.  $\frac{3}{8}$ " flat head wood screws are used. Plastic wood is used to make a fillet around the gull. By studying the pictures you can see how this is done.

Carve out the landing gear fillets roughly; notch them and glue on well. The brass axle holders are bolted on next. Note that the tips are filled with solder and drilled to received a 6/32" bolt. The landing gear is streamlined with  $\frac{1}{4}$ " thick inner pieces and  $\frac{1}{8}$ " thick outer pieces of medium balsa. The lower streamlining finishes the landing gear except for shaping and sanding.

The stringers are all hard balsa  $\frac{1}{8}$ " x 1/16". There are thirty-two in all. The tail wheel streamline is made of medium balsa and will have to be made according to the size wheel you use.

The windshield is made of one piece of celluloid with a piece of stiff manila paper cut out to simulate the various panels.

You will probably have to make a gas tank because the regular Baby Cyclone tank is a trifle large. It is bolted to the firewall. The gas-line is either brass or copper  $\frac{1}{8}$ " O.D. tubing with a rubber elbow for a connection.

You may have trouble making the top and bottom engine cowlings. The top one can be hollowed out of one piece of balsa, in which case no formers are necessary. The writer carved the front half out of two blocks, and made the rear half of  $\frac{1}{8}$ " x  $\frac{3}{8}$ " strips. Note that former No. 15 is cut to fit over the gas tank. The bottom cowling has several curves but if you use rather soft balsa and run the grain in the right way, you can make it easily enough and you will be amply repaid when you have finished it. The cowling holes are entirely optional and can be put in almost any place. Don't forget the holes for the exhaust and the needle valve stem. When you mount your Cyclone see that you don't leave too large a gap between the spinner and the cowling. The plans should tell you all you need to know about how to fasten the spinner to the prop. To make it, glue four blocks together. After shaping the outside, split them apart and hollow out. All the engine cowling screws to gussets.

The struts will vary a little. They are made of basswood and are a half-inch wide

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by one-quarter inch. The wings' ends are simply a hinge affair with hard balsa shear pins serving as the pins. To streamline the ends make a former as shown and glue it to the strut. When dry, fill in all around with plastic wood. Cut an opening for the shear pins. The fuselage end is a brass tubing socket that slips over a bent piece of 3/32" welding rod, one end of which is threaded 2/56. It goes through the landing gear just ahead of the hickory leg, not through it. Through each butt rib and tubing a small hole is drilled, into which common pins or wire staples are pushed. This is amply strong enough to hold the wings on but they will break off quite easily when the occasion arises.

Covering the airplane is quite easy; two coats of good dope will practically elim-

inate all wrinkles. The original model was painted the conventional army colors but it could be painted to represent a commercial plane or racer. Two coats of good brushing lacquer will give it a fine finish. You can polish the whole plane with wax or liquid polish to get a shiny surface.

A word or two about flying. Balance the plane by moving the batteries and set the stabilizer at 1 1/2 degrees negative incidence. The engine is offset to the right 1 1/2 degrees, but otherwise leave the thrust line alone. Unless you put a timer on your plane don't fill the tank more than a quarter full, and raise the tail of the plane when you start the engine. This brings the gas level well above the needle valve. It is not advisable to fly the plane with the spinner or bottom cowling on be-



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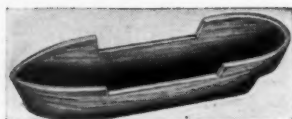
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cause even a minor crack-up will probably break it completely.

Take it easy, work carefully and you will have a gas model you can be really proud to own.

### Germany Builds an Air Force

(Continued from page 7)

The Fw. 56 "Stösser" is their latest advanced trainer and home defense machine. It is a beautiful looking monoplane with exceptionally clean lines. Powered with an Argus As 10 C eight cylinder, inverted air-cooled engine of only 240 hp. it has a maximum speed of 167 m.p.h., a cruising speed of 153 m.p.h., and lands at 56 m.p.h. The service ceiling is 20,000 feet and the range is 231 miles, fully loaded. Soon this type will be fitted with a 370 hp. engine giving it a top speed of 220 m.p.h.

The fuselage consists of welded steel tubing, covered with Elektron sheeting to the cockpit, and fabric covering to the tail. Quickly detachable cowling greatly facilitates repairs. The pilot is provided with the usual flight instruments, radio, oxygen equipment and one or two machine guns and bomb levers. The wings are supported above the fuselage by large chrome-molybdenum "Vee" struts and a pair of "N" cabane struts. Two spruce box spars and spruce ribs, covered mainly with fabric, make up the wing structure.

The undercarriage consists of two cantilever legs with helical springs and oleo damping. The wheels are equipped with brakes operated by oil pressure. The tail skid has a hard manganese steel shoe and a compressed air shock strut.

The tail surfaces follow the usual German practice of mounting the stabilizer and elevators above the fuselage. The fin is built integral with the fuselage. The rudder is a fabric covered spruce structure aerodynamically balanced. The horizontal tail is of spruce, covered with birch plywood. The elevator sections are rigidly joined by a shaft and are aerodynamically and mass balanced. Attached to the inner portions of the elevators are two vertical discs providing mass balance.

The fuel tanks, both main and auxiliary, are situated beneath the fuselage in front of the pilot. They are made in one piece.

The latest Focke-Wulf design is the Fw. 58-B "Weihe", a twin engined, low-wing monoplane with retractable landing gear. Like the "Stösser" it is used for training. In this case for bomber crews; gunners, pilots and radio men. It carries a crew of three or four and is powered by two Argus As 10 C engines of 240 hp. each.

The fuselage consists of chrome-molybdenum steel tubing, fabric covered, with the wing built integral with the fuselage and having a metal "nose" fitted over the leading edge with fabric from thereon. Flaps extend the whole length of the trailing edge of the wing. The outer sections also serve as the ailerons. The tail is principally a metal frame covered with fabric. Fully loaded at 6,170 pounds, the maximum speed is 158 m.p.h.

Another concern building similar designs to those described above, is Arado. Though not so well known, it has produced several noteworthy types suitable for military purposes. The Ar. 76 is a single place mono-

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plane for training fighter pilots. The fuselage is a welded steel structure, the front and top of which is metal covered, the remainder fabric. The engine is the well known Argus As 10 C, delivering 240 hp.

The wing spars and ribs are wood and the wing surfaces are completely covered with plywood. Struts with wire bracing support the wing above the fuselage. The single strut landing gear is of cantilever design and is fitted with hydraulic and rubber shock absorbers and hydraulic wheel brakes.

The tail is so designed that the rudder is mounted in front of the elevators and is a metal frame, fabric covered. There is an adjustable flap on the elevator. The Ar. 76 has a maximum speed of 166 m.p.h., cruising 137 m.p.h., and lands at 62 m.p.h. The cruising range is 292 miles and the service ceiling is 21,000 feet.

In the Ar. 77 we see a design that is so similar to the Fw. 58-B that it seems probable that these two ships were built for a competition and proved so good that both were accepted! The Ar. 77 is a trainer carrying a crew of four and has as motive power, two Argus As 10 C engines of 240 hp. each. The fuselage, composed of steel tubing, fabric covered, is said to be very roomy and comfortable.

The wings are wooden, compositely covered with plywood on the under surface and with fabric on top. The tail surfaces, of typical German make, are metal, covered with fabric. Both the rudder and elevators are equipped with controllable trimming tabs. Unlike the "Weihe" the Arado has a single strut landing gear enclosed in streamline pants. With a full load of 6,470 pounds, the Ar. 77 has a maximum speed of 150 m.p.h. and a cruising range of 450 miles.

Besides their training monoplanes Arado is producing the Ar. 68 in large quantities. This is a biplane fighter fitted with a B.M.W. VI liquid cooled engine of 650 hp. The fuselage is a metal frame of welded steel tubes covered with fabric and wooden fairing, fabric covered. The lower wings have landing flaps. A single strut landing gear is enclosed in streamline pants. It has a maximum speed of 205 m.p.h. and a ceiling of 24,272 feet.

When the new air force was being developed the first general purpose planes were Heinkel He. 70's, a speedy low-wing monoplane with retractable landing gear, boasting a speed of about 235 m.p.h. Its duties were to do everything the heavy Ju. 52's couldn't do and even with temporary military equipment installed the He. 70 worked miracles. At present, having had time for real experimentation, Heinkel is now busy supplying to the air force two place fighters, with of course, more powerful engines, all based on the He. 70.

There are still many squadrons still flying the He. 51, a single place biplane of orthodox construction, powered with a B.M.W. VI engine of 630 hp. The framework is of metal, covered with fabric and a single strut landing gear, with pants, which gives it a strong resemblance to our Curtiss "Hawks."

Although details are not yet available on the new Dornier medium bombers, the Do. 23 twin engined monoplane is at present the standard medium bomber-transport now in service. Powered by two B.M.W.

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VI U engines of 750 hp. each, it has a maximum speed of 161.5 m.p.h. and a cruising range of 745 miles fully loaded. The wings and fuselage are made of dural with fabric covered wings. The monoplane tail has a metal framework, covered with fabric. This model however is now obsolete and is speedily replaced by more advanced Dornier designs.

While on the topic of bombing it is interesting to study German practice in this field. This is done in a very systematic way as yet untried anywhere else and is giving the Germans valuable data for the future. For bombing practice actual buildings and railways of all sorts are built and different types of bombs are used on all the different structures. Therefore they

not only learn how long it takes to put a railway out of action but what types of bombs to do it best with.

Another beautiful idea that they use is that, after bombing, they see how long it takes to put the railways into working order again. This gives the engineers plenty of valuable practice.

In conclusion we see that in the development of her air force Germany is so far stressing the defensive branch and is busily engaged turning out quantities of fighters and attack planes. The larger four engined types are not yet in evidence. Probably as soon as her air strength permits it and everything is working smoothly we may yet see something. Then most likely production and research will begin on the



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into position between the extending portions of the rearmost spar. Now, the entire wing panel is covered with fine Jap tissue, water sprayed, but left undoped for the present time.

The next procedure is to apply cement generously to the joiner spars and also between the double bulkheads B-2 and B-3 before sliding the wings upward into position. This detail is shown on the side view drawing of plate 1. Study the perspective sketch on plate 2 for clarification of this procedure.

A full size drawing for the landing gear wire is given on plate 4. The wire is bent to the shape shown from No. .018 piano wire. Attach with cement to former B-1A allowing it to dry in that manner first. Afterward, it is made doubly secure by threading it with strong white cotton with an additional coat of cement over it. This detail is shown by the perspective sketch on plate 2 and by the side view drawing on plate 1.

### Rudder and Elevator Detail

The rudder is constructed entirely from 1/16" sheet. Measurements for the various members making up this unit are taken from the plan and doubled for full scale. Both sides are covered with Jap tissue and water sprayed. It is not necessary to dope either rudder or elevator surface. The elevator is constructed in one unit entirely out of 1/16" sheet. When completed it is placed directly on top of the longerons and cemented. Not until this unit has hardened into position is it covered on both sides with Jap tissue, and water sprayed. The rudder however, is not attached until all the fuselage stringers have been inserted and the body covered. Between formers T-1 and T-3 all stringers inserted must measure 1/32" x 1/16". The remainder of the stringers used throughout the fuselage measure 1/32" x 3/32". These stringers protrude 1/32" above the formers themselves. A tail skid is shaped as shown, faired with a small piece of sheet balsa and cemented into position as indicated.

### Windshield and Door Detail

The windshield is constructed mainly from small pieces of celluloid patterns cut to the shapes shown. The framework to which these pieces are cemented are cut from slivers of bamboo, 1/32" thickness. Build up the frame first and later carefully cement the patterns into position.

To facilitate easy insertion and removal of the power plant a door is provided at the rear of the fuselage. It is cut to shape from a soft piece of balsa measuring 3/16" x 1" x 1 1/2". The forward end of the door retains the contours of former S-7. From this point on the contour gradually assumes a more flattened effect until, at its termination, it is flush to a balsa plate, as shown in the fuselage drawing on plate 1. In other words, the exterior shape of the door simply retains the merging elliptical and rectangular shape of body at the rearmost portion. Hinges for the door are made from bond paper to which cement is applied.

### Nose Detail

The nose unit is constructed in halves.

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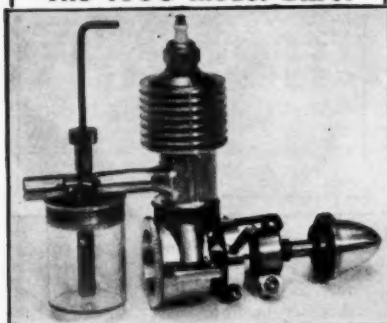
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### Building the Heinkel "Pursuit"

(Continued from page 23)

edge is cut, notched, sanded to shape and then cemented into position. The next step is to cut to shape two joiner spars from 1/16" sheet, as shown on plate 1. The leading joiner spar is cemented into the notches especially provided in ribs E and F. The wing tip pieces are cut to shape from 1/16" sheet and attached as illustrated.

The leading edge and center section (top and bottom) are covered with 1/32" sheet balsa. After the sheet covering along the leading edge has dried thoroughly, sand the forward edge carefully to conform with the airfoil section. The remaining wing panel is constructed in the same manner; being mindful of the fact that the extending portion of the leading joiner spar must be cemented into position before the lower surface of the center section of this wing is covered with sheet balsa. The rear joiner is cemented



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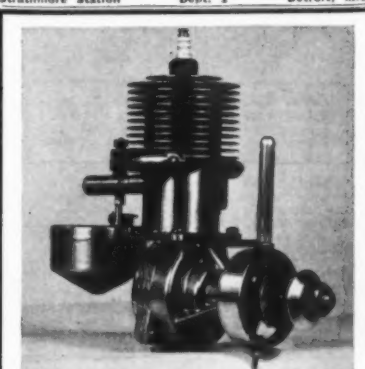
Standard propellers are mahogany stained and varnished. DeLuxe Propellers have metallic finish. Every propeller is perfectly balanced by new machine method. Standard DeLuxe

12" dia. (8" or 10" Pitch).....	\$ .60	\$1.00
13" dia. (8", 10", or 12" Pitch).....	.70	1.15
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Two blocks of semi-hard balsa, each measuring 1½" x 3" x 4", are selected and the outlines of the nose traced upon their surfaces. Study the cross sectional views on plate 3 of this unit before attempting to shape. Work slowly and use extreme care in doing so. For the moment leave the outer surfaces unsanded. The inner portions of each half are scooped out to the wall thickness as indicated by the dotted lines. Clean out thoroughly with sanding and upon completion, cement both parts together. When dried, a sanding is applied to the outer surfaces of the nose, followed by a couple of coats of dope and completed with a final sanding with smooth paper. The cylinder banks are shaped from soft balsa measuring ½" x 1½" x 4". Views for shaping the banks are clearly indicated on plates 1 and 2. The undersides are given a concave form which facilitates their attachment to the rounded portion of the nose block. Use plenty of cement in mounting these pieces.

The air scoop detail is constructed with two pieces of sheet balsa whose dimensions are given on drawing plate 1. The larger of the pieces is cemented in a slanting horizontal position between the cylinder banks. At the forward end a smaller piece is cemented, also slantwise, as shown in the side and top view drawings of the nose detail. Twelve exhaust ports are next to be cut to size and shape. Six are attached to each side of the nose. Though no two (on one side only) ports are alike, nevertheless they are all cut to the same length at first and resized to

fit, because of the varying contours of the nose. This procedure will soon become apparent as you attempt to cement the ports into position. A close study of the photographs of the model will be of material assistance.

The nose plug, which is shown in full scale, may be made up either from a single piece of wood or with a rear plug attached separately. A hole is drilled in the center and to each end a small brass eyelet bearing is inserted and cemented. Be sure the plug fits into position quite snugly, yet is easily removable. The radiator formers are also shown in full scale. They are assembled as shown and afterwards covered with 1/32" thickness sheet balsa. Apply a couple of coats of dope to this balsa covered unit. Next, onto stiff paper, draw a honeycomb radiator design large enough to cover the area of the front radiator former. Cut this to the desired shape and cement to the front former. Cement the entire unit beneath the belly of the fuselage, in the position shown on the side view drawing. Do this only after the fuselage bottom has been covered and doped.

**Landing Gear Details**

Four pieces of medium strength balsa compose the landing gear legs. These parts are given in full scale on plate 4. The larger of the legs is identified as L-1 and the smaller as L-2. The wheel pants are L-3. Both L-1 parts are cut to shape and streamlined with smooth sanding. Into the inner sides of both landing gear parts L-1 cut a 1/32" deep groove along





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25 feet .....05c**

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Rubberhubs, 1/4 oz. bottle.....04c  
Balsa Wood, 36" lengths, 1/16 x 1/16  
to 1/16 x 1/2, choice, eight pieces for.....05c  
3/4 x 3/4 to 3/4 x 3/4 Balsa, choice,  
six pieces for.....05c  
Hardwood wheels, 1 inch, pair.....02c  
" " 1 1/4 inch, pair.....02c  
" " 1 1/2 inch, pair.....03c

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Lightweight slide switch.....10c  
Dural wire, 1/4", 36" lengths, each.....03c

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the entire length of the leg as shown by the dotted lines on this part in plate 4. Apply cement generously into these grooves, and then attach the landing gear leg as shown in the side and front view drawings. Note carefully that the legs themselves are not attached flush to the sides of the body. A narrow space is provided to allow for spreading action. The same procedure is used in attaching the lower landing gear legs L-2 to the wire shock absorber and at the same time is securely cemented to the bottom of L-1. See front and side view landing gear drawings on this.

The wheel pants are made in the conventional manner. To the inner sides of both wheel housings cut out a slight hollow which is used to accommodate the lower ends of landing gear legs L-2. Apply an ample amount of cement when attaching these parts together. A bit of wood filler placed around the cemented area will assist in making a smooth fairing of both joinings. The perspective sketch, as shown on plate 4, illustrates this detail clearly. In mounting the wheel pants onto the shock absorbing wire, it is first necessary to place the wheel into the pants itself and line it up so that the wire ends may be slipped directly through them. Apply a bit of cement to the outer ends of the shock absorbing wire where they fit flush to the outer surface of the wheel housing.

Next, two lengths of 1/32" square rubber are required to serve as additional shock absorbers. These extend horizontally between the landing gear legs in a position just below the joinings of the upper and lower legs. Attach these with a slight tension, inasmuch as their primary purpose is to prevent the landing gear wire from spreading too much with repeated landing impacts.

## Top Wing

The required amount of ribs necessary for the top wing is cut to shape from 1/32" stock and notched for spars accordingly. Each panel is constructed in the typical manner of the lower wing. The center section is assembled in the manner shown, though requiring its outer ribs to be slanted inward 3/64" in order to obtain the desired dihedral angle. All panels are covered with 1/32" sheet covering at the necessary portions, and afterward are completely covered with Jap tissue and water sprayed before given a coat of dope. Now the right and left panels are cemented securely to the sides of the center

section. Use small prop blocks placed at the extreme ends of the wing tips to assist in maintaining the dihedral angle until the cement dries thoroughly. All wing and center section struts are shaped and streamlined from 3/32" x 1/8" medium strength balsa, cut to proper length. Full sizes shown on plate 4. The outer bay struts are identified as W-1 and W-2. The center section struts are assembled from three pieces as one unit, as shown. This set is identified as W-3.

## Propeller

The propeller is cut from a selected block measuring 1 1/4" x 2" x 9" long. On the face of the block draw two diagonal lines extending from corner to corner. In the center place a fair sized pinhole. Mark off the area that is to be fitted into the spinner cap. This is shown on the drawing on plate 1. Use care in cutting the prop to shape and do not cut the blades too thin. Leave that for the sanding to take care of. Round off the tips and lastly cement flush to the spinner cap. Before inserting and cementing the prop shaft, balance the prop carefully. Apply a few coats of dope over the blades to insure additional strength.

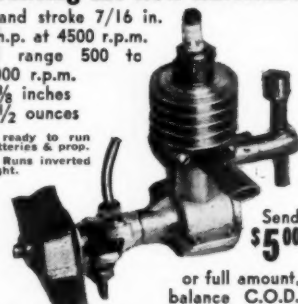
## Assembly

The center section struts W-3 are cemented to the sheet balsa covering over the fuselage cowl, as shown on plate 1. Inserting small model-making pins through these struts will aid in maintain-

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Bore and stroke 7/16 in.  
1/10 h.p. at 4500 r.p.m.  
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Ht. 2 3/8 inches  
Wt. 2 1/2 ounces

5 ozs. ready to run  
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ing greater rigidity. Be sure they are slanted at the proper angles before attaching the top wing. Insert more model-making pins at the top ends of these struts and push part way into the wing itself. Apply cement generously at all joinings. The outer bay struts are next to be cemented into position. They rest directly on and below a wing rib. The rigging wires consist of strong white threads. Both landing and flying wires are rigged double. The rudder is lastly cemented in position and perfectly aligned. The power plant consists of six strands of  $\frac{1}{8}$ " flat rubber. Better and longer flights may be obtained by using a gear winder.

#### Bill of Materials

- 5 sheets of balsa,  $1/16"$  x  $3"$  x  $36"$  for wing ribs, formers, bulkheads, tail surfaces, etc.
- 7 strips of medium balsa,  $1/16"$  x  $1/16"$  x  $18"$  for longerons, cross braces.
- 1 piece sheet balsa  $1/32"$  x  $3"$  x  $36"$  for fuselage cowl, cockpit and wing panel covering.
- 1 piece of soft balsa,  $1/2"$  x  $1/2"$  x  $1 1/8"$  for the nose plug.
- 1 block of hard balsa,  $1 1/4"$  x  $2"$  x  $9"$  for the propeller.
- 4 pieces of soft balsa,  $5/16"$  x  $1 1/2"$  x  $2 1/2"$  for the wheel housings.
- 2 pieces of soft balsa,  $3/8"$  x  $1 5/8"$  x  $3"$  for the landing gear struts L-1.
- 2 pieces of soft balsa,  $1/4"$  x  $5/8"$  x  $1 3/8"$  landing gear legs L-2.
- 1 piece of hard balsa,  $1/2"$  x  $1/16"$  x  $26"$  long for wing and center section struts.
- 1 piece of soft balsa,  $1/4"$  x  $3"$  x  $6"$  for the exhaust ports.
- 1 piece of soft balsa,  $1/2"$  x  $3"$  x  $10"$  for the cylinder banks.
- 1 block of soft balsa,  $1-1/16"$  x  $1-1/16"$  x  $7/8"$  for the spinner cap.
- 1 strip of hard balsa,  $3/32"$  sq. x  $36"$  for the leading edges of both wings.
- 1 strip of hard balsa,  $1/16"$  sq. x  $36"$  for wing spars of both wings.
- 2 strips of hard balsa,  $1/16"$  x  $3/8"$  x  $36"$  for wing spars of both wings.
- 1 strip of soft balsa,  $1/16"$  x  $5/16"$  x  $36"$  for trailing edges, top wing.
- 1 strip of soft balsa,  $1/16"$  x  $1/4"$  x  $18"$  for trailing edges, lower wing.
- Jap tissue, cement, dope, sandpaper, white thread, model-making pins, and one foot of No. .018 wire for the landing gear.
- Six inches of .038 wire for propeller shaft and tail hook.

### The Army's Flying Dreadnaught

(Continued from page 10)

The B-15 has a double truck landing gear. Its four huge pneumatic tires rise in diameter well above the head of the average man. They support its gross weight of thirty tons while it is resting on the ground. Both landing gear and tail wheel are retractable. Wheel brakes to aid in take-offs and landings are operated by the use of compressed air, similar to the system used in modern buses.

The interior is almost like the "flying hotel." Living quarters for the crew are included to accommodate the personnel during sustained flight operations. There is a small kitchenette which contains an electric hot-plate, percolator, soup-heater and dry icebox. The working and living

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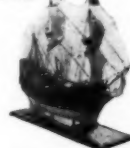
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BEAR OF OAKLAND	15 1/2"	1 1/2"
ARABELLA	15"	2"
SEA BIRD	17 1/2"	3"
XEBEC	17"	2 1/2"
HISPANIOLA	17"	3"



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At the completion of the test flights at Wright Field experts claimed this giant of the air was the greatest ship ever to

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### More Power For Your Club

(Continued from page 31)

necessary changes quite obvious. For the most part the top portion of the nose cowl is left open to facilitate engine mechanics, etc.

Due to the increased power it remains a good policy to use plenty of fresh rubber bands in holding the wings and tail surfaces securely bound between tie-down hook members.

The greater power should increase the climb 150 feet per minute.







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$$A_s = 232 \text{ square inches.}$$

Thus the area of the stabilizer should have a minimum of 232 square inches, which is 22.4% of the wing area. This small stabilizer area is possible because of the stabilizing effect of the parasol wing. This factor is taken into account in the formula.

However when unusual stability is desired it is always advisable to add 20% more area to the stabilizer. The area of this surface should be  $(232 + 47.8) = 279.8$  square inches for plane No. 1. This is 27.2% of the wing area, which is nearly the value of 30% specified by the general rule. The larger amount could be used without causing difficulties. In fact it would make the plane more stable than necessary.

Now the stabilizer area of plane No. 2 may be determined by following a procedure similar to the method used in calculating the fin area of plane No. 2, which has exactly the same proportions as plane No. 1, but smaller in size.

Because of this fact the stabilizer area of plane No. 2 should be the same proportion of the wing area as the stabilizer of plane No. 1. The wing area of plane No. 2 is 677 square inches. The stabilizer area then should be 27.2% of 677 square inches or 184 square inches.

**Shape of Tail Surfaces**

The shape of the tail surfaces are important from an efficiency standpoint rather than one of stability.

The fin will serve its purpose well if it is 1.8 times as high from top to bottom as it is wide at its maximum width. If the fin is entirely above the fuselage, the fin depth should be measured from the top to the lowest point of the fuselage under the fin. In order not to cause undue turbulence as it passes through the air, the tips of this surface should be curved or elliptic in shape.

The stabilizer should have a span equal to  $3\frac{1}{2}$  to 4 times its maximum chord. The tips should be curved or elliptic in shape. An elliptic makes a very efficient outline shape for this surface.

**Cross Section of Tail Surfaces**

The airfoil section to be used on the fin and stabilizer is not extremely important. However a streamline shape rather than a flat surface is advisable from an efficiency standpoint. A section, the maximum thickness of which is  $1/10$  the chord, will give fine results and will allow deep spars to be used. The top and bottom camber may be equal in height, but a lifting section on the stabilizer, such as the Clark Y, will provide an extra measure of stability.

If a positive cambered section as the Clark Y is used on the stabilizer, the angle of incidence should be about three degrees less than the angle specified previously. It was advised that the stabilizer be set at  $+1^\circ$ . Thus, a positive cambered section should have an angle of incidence of  $-2^\circ$ .

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1 pint. ....45  
**REED**  
1/16" 4 ft. ....02  
3/16" 6 ft. ....05  
3/32" 8 ft. ....02  
**BROWN RUBBER**  
1/16" flat 20 ft. ....05  
for .....10  
3/32" flat 25 ft. ....10  
for .....05  
1/32" sq. 25 ft. ....05  
for .....10  
1/8" flat 20 ft. ....05  
for .....10  
**WHEELS-PER PAIR**  
1 1/4" 2 pr. ....03  
1 1/2" 2 pr. ....02  
1 3/4" 2 pr. ....03  
1 7/8" 2 pr. ....03  
1 3/4" 2 pr. ....03  
1 7/8" 2 pr. ....03

**WASHERS**  
Large or small  
2c a dozen  
**BALMCO**  
1/16" x 1/4" x 15  
5 for 1c  
**BALSA PROP BLOCKS**  
3/16" x 1/2" x 3 for .05  
1/2" x 3/4" x 6 for .05  
3/8" x 1" x 7 for .05  
3/8" x 1 1/4" x 12 for .04 1/2  
7/8" x 1 1/2" x 15 for .06  
1 1/2" x 2" x 15 for .07  
**WIRE**  
1/16" 1 ft. ....05  
1/32" 6 ft. ....02  
1/16" 6 ft. ....03  
1/32" 3 ft. ....02  
1/16" 3 ft. ....03  
1/32" 1 ft. ....05  
**BALSA**  
3 ft. sheets  
1/16" x 3 each .06  
1/16" x 2 each .03  
3/32" x 3 each .07  
3/32" x 2 each .04

1 1/4" x 3 each .07  
1 1/2" x 2 each .04 1/2  
3/16" x 3 each .09  
3/16" x 2 each .06  
1/4" x 3 each .11  
1/4" x 2 each .07  
**PAULOWINIA WOOD PROP**  
5" .....06  
6" .....08  
7" .....10  
8" .....12  
**BALSA**  
3 ft. lengths  
1/16" sq. 18 for .05  
1/16" x 1 1/2 for .05  
1 1/2 x 3/16 7 for .05  
3/16 sq. 6 for .05  
1/4 sq. 3 for .05  
5/16 sq. 3 for .05  
1 1/2 sq. 2 for .09  
**CELLULOID COWLS**  
1 1/2" each .....10  
2" each .....12  
3" each .....24

**ALUMINUM TUBING**  
1/16" O.D. ft. ....10  
3/32" O.D. ft. ....10  
1/8" O.D. ft. ....10  
3/16" O.D. ft. ....13  
**ALUMINUM COWLS**  
Drag ring open or closed face  
1" dia. each 10  
1 1/2" dia. each 12  
2" dia. each 13  
2 1/2" dia. each 18  
3" dia. each 20  
**CELLULOID MOTORS**  
1 1/2" each .....06  
2" each .....10  
2 1/2" each .....12  
3" each .....14  
**MACHINE CUT PROPS (BALSA)**  
5" .....2 for .05  
6" .....each .03  
7" .....2 for .07  
8" .....each .04

#### ORDERING INSTRUCTIONS

Add 15c packing charge orders under \$1.50. Orders over \$1.50 add 10% of order. No stamps or C.O.D. Canadian Orders add 35c up to \$1.50. All orders over \$1.50 add 10% of order plus 20c.

STINSON MODEL SUPPLIES, 25-15 Bridge Plaza N., Long Island City, N. Y.

SEE  
PAGE 3!

### ANNOUNCING "O.K."



#### AN EASY STARTER! A CONSISTENT PERFORMER!

A motor radically different with a newly developed cylinder free from welded, braced, clamped or cast-on ports or passages. (Patents applied for). This construction eliminates cylinder distortion which is the main cause of bad starting and fatal performances of miniature motors. Built up to highest engineering standards: one piece alloy steel cylinder, one piece alloy steel crankshaft, one piece alloy steel drop forged and heat treated connecting rod. SPECIFICATIONS: Bore .900"; Stroke 31/32"; Displacement 10 C.C.; H.P. 1/8; plane, R.P.M.'s 1200-3000; Prop. 1 1/4" or 1 1/2"; Height 4 1/16"; Weight, bare, 7 3/4 oz., radial or lug mounting.

PRICE of "O.K." motor with coil, condenser, spark plug and gas tank **\$21**

Order through your dealer or direct from  
**HERKIMER TOOL & MODEL WORKS**  
Dept. A Herkimer, N. Y.

factors of our gas model now have been established. Only one major one remains: that is, the propeller. This is the most mystifying one of all and the one which has the greatest effect on the flight efficiency of your model.

Next month the theory involved in creating this most important part of your plane will be discussed, and practical, applicable rules for its design will be presented. Until then—"perfect take offs" to you and your "crates."

#### Gas Lines

(Continued from page 29)

Trophy. Others who placed in this event were awarded Metropolitan Model League plaques, gas model kits and streamlined wheels.

Harold Spates of Baltimore, Md., won the midget duration event and received the Scientific Trophy. Frank Ehling of Jersey City placed second and received an Ohlsson engine. Gilber Sherman placed third and received an IMP propeller clock. Others placing in this event received Metropolitan Model League plaques and other merchandise prizes.

Roger Hammer won the large scale model event with a model of a Taylorcraft. Second place was won by H. Jambo with a Rearwin model. He received the MODEL AIRPLANE NEWS Trophy. Thomas Mintze won third place with a Polish Fighter and received a Condor Midget engine. Walter Bobkiewicz, flying his

Corbin Super ace for fourth place, received a Syncro Ace engine. As a reward for attaining the highest scale model score he also received a Howes adjustable pitch propeller. Metropolitan Model League plaques and model materials went to other place winners.

Assisting in the conducting of the contest were Walt Grubbs, Junior N.A.A. executive, Philip Zecchettel, editor of the "Arpm," Avrum Zier, Lt. Jack Scherer of the National Aero Reserve, Walter Hurlman, William Berry, Philip Shays, H. Eustas Ackley, Prof. T. N. de Bobrovsky and Michael Poitras. Among the several thousand spectators were Capt. Frank Hawks, Fred Chapman, R. K. Allen of Pittsburgh, C. W. Rogers of Detroit, Lawrence Shaw, William Winter, Messrs. Lou and Sol Kramer of Baltimore, Md.

#### California Contest

One of the biggest contests ever held on the west coast was that at Camp Kearney Mesa, California, on April 24th. There were over 175 entrants who participated in this third annual meet. It was sponsored by the San Diego Aeroneers of San Diego, California, and sanctioned by the N.A.A.

The maximum motor run allowed was 35 seconds. The winning plane soared for 8 min., 31 sec., before disappearing from sight. Several other models were lost during the contest, and only two or three had been recovered by the time the meet was concluded. Over 6,000 spectators witnessed the event and 2,164 automobiles entered the field (by actual count). A highlight of the event was the take-off description of the contest, broadcast direct from the scene and released over Radio Station KFSD of San Diego, by remote control. As far as is known, this is the first time a gas model contest has been broadcast in the United States, and probably the world. Thereby the San Diego Aeroneers, with the gracious cooperation of KFSD (who were highly pleased with the result of the program), have taken a big step forward in establishing this precedent. Very favorable comments on the broadcast have reached KFSD from distant listeners all over the western part of the country. KFSD is a member of the N.B.C. network.

The meet attracted entries from all over the southern half of California, from as far as 500 miles distance. Out of a total of 176 entries, 43 were from San Diego, 60 from Los Angeles, 13 from Glendale, and 60 additional from various other towns and cities. The following gas modelers were the first three place winners:

First Place—J. C. Williams, Los Angeles (8 min. 31 sec.) Awarded \$50 cash, \$50 Irving Aircraft School Instrument Course, and Solar Aircraft Trophy.

Second Place—John Berg, Los Angeles (8 min. 1 sec.) Awarded \$25 cash, and Flying Aces Trophy.

Third Place—Ludwig J. Kading, Compton (7 min. 10 sec.) Awarded \$15 cash and MODEL AIRPLANE NEWS medal.

As in the Eastern States Contest, there were many crack-ups due to the high wind which prevailed.

Picture No. 5 shows the model Stinson, entered by Floyd Parks of Los Angeles,



just taking off and reaching for the sky.

Picture No. 6 shows an unusual type of gas model; a low-wing which made the longest flight for this type of ship. Unless low-wing planes are carefully designed they are apt to be unstable. This one flew with great precision.

Picture No. 7 shows the plane, and its builder, which won the biplane event. It is a model of a Beechcraft. The gentleman shown is Mr. E. Waterman of Hollywood. The plane was powered with an Ohlsson motor and weighed four pounds, six ounces. The wing span was forty-six inches.

In picture No. 8 we have Peggy Snyder with her plane. Peggy is the wife of well-known Barney Snyder. She was one of the winners among the women fliers. Her ship is a Modelcraft Scout powered with a Dennyrite motor.

Picture No. 9 shows Mr. H. F. Congable, vice-president and general manager of the Madewell Manufacturing Company, with his "Old Reliable" gas model. This is a twenty-seven ounce plane with a four foot wing spread and has made about 500 successful flights. It is powered with a Madewell Mite engine. The ship is still in perfect condition and the original motor has seen about fifty hours of running.

For two years Maxwell Bassett has held the I.G.M.A.A. Trophy, which is now awarded by the Gas Model Division of the National Aeronautic Association for the longest gas model flight of the Association. Now, at last, we have news that Bassett's record of twenty-three minutes, eighteen seconds, has been broken. The report comes to us that in a flight of 26 minutes, 25 1/5 seconds, a Megow "Quaker Flash" constructed and flown by Roland Fischer of 4510 Elm Court, Denver, Colorado, recently won the world's flight record for gas powered model airplanes. The flight was made at Denver, Colorado, and received the official recognition of the National Aeronautic Association. The ship, with a wing span of sixty-seven inches, and weighing three pounds, was built in June, 1937. The owner says it has since made so many flights that he lost count of them long ago. During the past year this model has flown in a number of contests and has proved to be a consistent prize winner.

We are now waiting for verification of this record. As soon as it is determined that this flight is official the trophy will be passed on to Mr. Fischer. Roland has our heartiest congratulations on his accomplishment. He is shown in picture No. 10 with his record breaking plane.

Mr. Charles Tracy, a leader of the Scripps-Howard Junior Aviators of Toledo, tells us that they are going to have one of the biggest gas model contests for the state of Ohio on June 12th at the Toledo Municipal Airport. This meet is to be sponsored by the "News-Bee" Junior Aviator Department and the Toledo Model Airplane Supply Company. Everyone is invited to enter. N.A.A. rules will be in effect. Entry blanks may be obtained by writing Mr. Tracy, "News-Bee," Toledo, Ohio.

The Linden Model Aircraft Club, Old City Hall, Linden, New Jersey, will hold its first annual gas model championship contest on June 25th, at Hadley Field,

## Proven Efficiency...

### of "BESHAR PRECISION PROPS"



#### GAS MODEL PROPELLERS

Proven the most efficient shape and airfoil section by actual test. Over 50 models built and tested. These Props get the maximum efficiency and flight out of your model. Some propellers just have efficiency—others just a finish. Beshar Props have everything. Finest Mahogany wood, super-deluxe glass-like finish, and are hand-carved in U.S.A. Complete size and pitch range, perfectly balanced, precision jig uniformity, and cost no more than ordinary propellers. If in doubt specify size, weight and motor of model.

<b>Mahogany Prop</b> <b>Blank-cut to</b> <b>shape, tapered and</b> <b>drilled.</b> <b>Small ..... 20c</b> <b>Large ..... 30c</b>	<table border="0"> <tr> <td>8" dia. (8 or 10" pitch).....</td> <td>\$ .75</td> <td>15" dia. (8, 10 or 12" pitch).....</td> <td>1.50</td> </tr> <tr> <td>10" dia. (8 or 10" pitch).....</td> <td>.75</td> <td>16" dia. (8, 10 or 12" pitch).....</td> <td>1.50</td> </tr> <tr> <td>12" dia. (8, 10 or 12" pitch).....</td> <td>1.25</td> <td>18" dia. (12" pitch only).....</td> <td>1.75</td> </tr> <tr> <td>14" dia. (8, 10 or 12" pitch).....</td> <td>1.25</td> <td></td> <td></td> </tr> </table>	8" dia. (8 or 10" pitch).....	\$ .75	15" dia. (8, 10 or 12" pitch).....	1.50	10" dia. (8 or 10" pitch).....	.75	16" dia. (8, 10 or 12" pitch).....	1.50	12" dia. (8, 10 or 12" pitch).....	1.25	18" dia. (12" pitch only).....	1.75	14" dia. (8, 10 or 12" pitch).....	1.25		
8" dia. (8 or 10" pitch).....	\$ .75	15" dia. (8, 10 or 12" pitch).....	1.50														
10" dia. (8 or 10" pitch).....	.75	16" dia. (8, 10 or 12" pitch).....	1.50														
12" dia. (8, 10 or 12" pitch).....	1.25	18" dia. (12" pitch only).....	1.75														
14" dia. (8, 10 or 12" pitch).....	1.25																

\*Special sizes and pitches at same proportionate prices.

#### Balsa Outdoor Props

for Commercial, Scale or Stick Models. Finished, ready for use, with free-wheeling attachment.

6" dia.....	\$ .65
12" dia.....	.75
14" dia.....	1.00
16" dia.....	1.25

Write for special sizes

#### Balsa Indoor Props

Carved paper-thin, of quarter-grained Balsa, most efficient made, ready for use.

8" dia.....	\$ .75
12" dia.....	1.00
14" dia.....	1.25
16" dia.....	1.25

All props sent Postpaid—Send 3c for Catalog

**"WATCH BESHAR PROPS AT THE NATIONALS"**

## BESHAR MODELS

NEW ADDRESS **329 EAST 54 ST., N. Y. C.**  
 "Premier Model Airplane Showrooms of America—  
 1939 World's Fair"

New Jersey. If you wish to enter write Mr. Carl Frank, secretary of the club, at the above address.

The Gulf States Model Airplane Meet, sponsored by the New Orleans Junior Chapter of the N.A.A., will hold its contest on July 16th and 17th, instead of June 16th and 17.

The Stix, Baer and Fuller Model Airplane Club of St. Louis, Missouri, has "crashed" 1938 with great activity. Weekly meetings are being held. Their eliminations for the 1938 Nationals will be held on June 23rd and 25th, and the sixth annual Mississippi Valley Tournament will be held on August 13th and 14th. These last two dates are tentative.

Good news comes from the Boston Gas Model Society. The secretary writes as follows:

"We may now fly gas models in Massachusetts according to official announcements. Builders are requested not to publicize this fact. Models must be flown away from densely populated areas, away from busy highways, and not within several miles of an airport without notifying the airport manager and securing his permission.

"From a reliable source it is understood that a measure is now before the legislature which will permit aviation authorities to put certain restrictions on gas modeling. These will work for the benefit of the serious enthusiast and restrict the careless flier. In addition to this, for your own protection, we cannot too strongly urge you joining the new N.A.A. Gas Model

### THREE WISE MEN

(hundred)

## 300

Young men are enrolled  
now at CURTISS-  
WRIGHT TECH  
training for their  
future

YOU must train for your future

**The Untrained Man Hasn't A Chance**—The completely trained man has all the odds in his favor—you can enjoy the good things of life provided you are properly prepared—Curtiss-Wright Tech's great name, prestige and long years of experience guarantees you the finest training in the world. Because of Curtiss-Wright Tech's distinguished reputation and years of experience in successfully training young men for aeronautical careers, there is a constant waiting list of employers for Curtiss-Wright Tech graduates. Consequently there is no indefinite period after graduation when you will be "looking for a job." You will start earning at once. Your Curtiss-Wright Tech training will insure your future prosperity since you will have the necessary preparation to command higher salaried positions and win rapid advancement.

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information on the course I have checked.)

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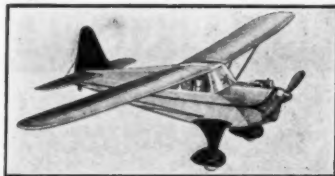
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## REARWIN SPEEDSTER

### The Aerodynamically Perfect Gas Model

While others crashed at recent meets, the Rearwin Speedster, fully scaled, proved that its set up tends to produce the stable gas model—neither high wind, nor expert excuses, could stop it from its steady flights. Can be powered with any good gas motor.



64" WINGSPAN  
Now \$4.50 Postage and Packing 30c

Designed so that it can be tested with rubber band, compressed air, or Acco motors, before mounting gas engine. Send 10c for complete catalogue of airplanes, boats, trains, motors, diagram, and charts.

**INTERNATIONAL MODELS** 251 WEST 55th STREET  
NEW YORK CITY, N. Y.

Division. Address inquiries to the National Aeronautic Association, Dupont Circle, Washington, D.C."

Mr. J. P. Bowman of 3542 Tacoma Avenue, Los Angeles, California, sends us some comments which may be of interest and help to gas model builders. He says:

"Gas timing—Timers, as we all know, often fail to operate efficiently, if at all. Besides this they are rather expensive. If you want to be *positive* that you will not lose your ship, purchase an ordinary medicine dropper. Remove the rubber and glue a section of fabric or rubber gas line on the small end. Mount it and you have a gas tank that will hold enough fuel for about one minute. Incidentally it can be calibrated for 10, 20, 30 seconds and so on.

"A great many believe that when their booster batteries go dead that all flying is over for the day. A simple remedy for this is to either connect a piece of German silver wire to one of the terminals of the automobile battery or to fasten your booster wires across *one* cell of the car battery.

"An efficient needle valve extension can be made for such engines as the Baby Cyclone and other gravity feed engines in a few minutes. Purchase or wind a piano wire spring about 1/16" in diameter and about 2" long. Solder one end to the needle valve and the other to a length of 1/16" piano wire. A small clock wheel can be soldered to the end of the wire. This wheel can be mounted in the cockpit or wherever convenient.

"One way to make electrical repairs

easy is to mount the coil, condenser and batteries on a tray which in turn is mounted to a removable firewall. The engine is also mounted to this firewall. Thus by removing three bolts, the engine and complete ignition system can be taken out."

#### NOTICE

Mr. Louis E. Balla of 341 North Washington Avenue, Scranton, Pa., wishes us to announce that he lost his kit of tools at the Eastern States Contest, held at Seversky Field on April 24th. It was left on the field by mistake. Will anyone who has picked up this kit, or has any other information concerning it, kindly write to Mr. Balla or the "Gas Lines" editor.

#### N.A.A. Jr. News

(Continued from page 21)

Junior Aviators. They will be dined and feted with the world's greatest aviators and star race performers at the "Famous Flyers' Luncheon," which is staged annually by Cliff and Phil Henderson, managing directors of the National Air Races, for the junior champions.

At this luncheon Major Al Williams, Junior Aviator Chief, will act as toastmaster and award the winners their prizes and trophies. The luncheon will be broadcast over a national radio hook-up so that the folks back home will be able to attend the celebration.

Events for every type of outdoor model will be included on this year's program. Endurance races for fuselage, stick and gasoline powered models; along with speed,

glider and originality events will again be sponsored by the nation's leading aeronautical leaders and concerns.

These events will be staged under the new rules and regulations of the National Aeronautic Association and all records will be given full recognition at Washington, D. C.

H. M. Jellison of Akron, well known to all model builders, has again accepted the appointment as contest director for the contest.

There are no restrictions as to the number of events a contestant may enter, but each entrant must be the owner and builder of his contest models and must sign a pledge to that effect.

Many Junior Aviators' cities will again direct city-wide eliminations to select builders whose expenses they will pay to the meet. However, win or lose in these contests, you can compete at the Nationals by simply paying your own way—which won't be very much. Make plans now to fly in this big meet.

#### Special Announcement!!

The New Orleans Junior Chapter of the N.A.A. is sponsoring a Gulf States Model Airplane Meet, scheduled for July 16 and 17, to which modelers from Texas, Louisiana, Mississippi, Alabama and Florida will be invited. This meet promises to be the largest ever held in the South, and with the prizes offered, compares favorably with the Nationals. Prizes at present total more than \$1,500 in value. It is hoped that this event will become an annual affair.

Events scheduled are as follows:

Flying Scale; Free-for-all.

Endurance, Classes C and D; Senior and Open.

Gasoline; Senior and Open.

Exhibition Scale; Free-for-all.

All N.A.A. members in good standing will be eligible to participate. The contest director suggests all model builders not N.A.A. members make their application to N.A.A. headquarters, Dupont Circle, Washington, D.C.

Requests for entry blanks, information on accommodations, rules, prizes, etc., should be addressed to Mr. W. Norman, Contest Director, Gulf States Model Airplane Meet, Delgado Trades School, 615 City Park Avenue, New Orleans, La.

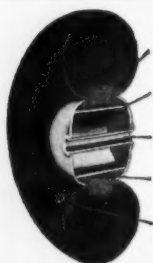
So there y'are, Jack! If you live in one of the above mentioned states, draw a circle around July 16 and 17, tie up your hair and go to it! Get those models in tune for what promises to be the biggest southern model meet in history. Good luck to you!

#### Florida

The Jacksonville Model Club of 2048 Roselle Street, Jacksonville, Florida, sends us the following news of a meet they are sponsoring. They say:

"On Saturday, June 18th, and Sunday, June 19th, Jacksonville will be humming with the flying of model airplanes.

"Make note of the dates and start in making your models now to get in your entries. This will be a state contest, sponsored by the Florida Aviation Association and assisted by the Jacksonville Model Club under the direction of William L. Timpone, N.A.A. Contest Director.



Coming

**M & M's Sensational High-Powered Small Bore Motor and Special Small Gas Job Wheels**

Gas Wheels

Rubber Powered Wheels

When Thinking of Model Protection

Think of M & M Super Wheels

3 1/2" & 4 1/2" Gas wheels—weight 2 1/2 and 5 oz. per pair.

Now only \$2.75 per pair, postpaid

Buy

M & M WHEELS

From your Dealer or

send to us.

Per Pair

Postpaid

For Air Mail

Add 21c

All M & M Wheels can be inflated & deflated.

If located in Washington add State Tax.

Dealers: Our New Discounts are Very Attractive.

**M & M MODEL WHEEL CO.**

325 North 79th Street

Dept. M7,

Seattle, Wash.



M & M Super Heavy Duty Wheel

for Rubber Powered Models

SIZES 1 1/2-1 3/4-1 1/2-1 3/4-PRICE

\$0.30 Per Pair, Postpaid

SIZES 1 3/4-2-2 1/4-2 1/4-2 1/4-PRICE

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25c-25c-25c-25c-PRICE

25c-25c-25c-25c-PRICE

25c-25c-25c-25c-PRICE

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**M & M 3 1/4" GAS WHEELS**

with improved M & M axle housing

for 9/64th or No. 28 drill rod axle

Designed for Light Weight Gas Models.

Weight approximately 1 1/2 oz. per pair.

Price \$4.50 per pair P.P.



## Easy to Assemble \$5 Easy to Operate

**ONE DAY DELIVERY** Over 7,000 of these same famous G.H.Q. gasoline engine kits have been sold at \$8.50 during the past year alone. Mass production methods and enthusiastic reception have enabled us to reduce the price from \$35 each originally to the **NEW LOW PRICE of \$5.** Identical with the original higher-priced kit and with the same Guarantee. New 1938 High Compression Piston and Cylinder. Coil, plug, etc. included. All parts finished—quickly assembled.

**Absolutely Complete!!**

## G.H.Q. ASSEMBLED \$10 ENGINE

Now offered at a new low price. The famous G.H.Q. Engine, completely assembled and guaranteed to run.

Send only \$1.00 and we will ship Express Collect C.O.D. for the balance.

**DEALERS** You can profitably sell these Motors **WRITE FOR ATTRACTIVE TERMS**

**G. H. Q. MODEL AIRPLANE CO.**  
854M East 149 St., New York, N. Y.

## EASTERN MODEL BUILDERS! SAVE TIME!

Order These Famous West Coast Kits  
From Us  
**IMMEDIATE DELIVERY**

Ohlsson Pacemaker.....	\$10.00
Bunch Scorpion Major (upright motor).....	6.95
Bunch Scorpion Senior (inverted motor).....	6.95
Douglas E-Gull.....	7.85
Modelcraft Pacific Ace.....	8.50
Modelcraft Scout.....	7.25
Modelcraft Carben Super Ace Dupont	
Trophy Winner (dry kit).....	5.75
Qt. Dope and Ft. Cement for Carben.....	1.25
New Brown Jr. Model "D" Motor.....	\$10.00
Valvoline Oil 2 Oz. Bottle.....	.10

### Rubber Kits

Douglas Aero-glide.....	\$ 2.25
Douglas Flying Cloud.....	1.75
Douglas Space Conqueror.....	1.75
Douglas Universal Speedster.....	1.50
Douglas Aerobat.....	1.25

Everything Sent Postpaid

**WILMER MODEL AIRCRAFT CO.**  
Wilson Avenue Frederick, Maryland

## The LANCER 30 30" WINGSPAN



Assemble this completely fabricated flying model—A precision kit by Burkard-Stevens. No sheets to cut, not a wire to bend. High efficiency air foil. Fool proof dihedral and wing mounting. **CRASH PROOF**—and we mean it! Every rib-former and block accurately die-cut. Wire parts bent to shape. Kit includes finished Paulownia prop, 1 oz. each of dope and cement, contest rubber, and size plan.

**BUILD IT TODAY—FLY IT TOMORROW**

Complete Kit Postpaid  
Anywhere in the U.S.A.  
**\$1.50**  
If Your Dealer Cannot  
Supply You Write Direct to  
**BURKARD-STEVENS**  
Model Aircraft Engineers  
Box 344-M, Larchmont,  
N.Y.

**A PRECISION KIT**

## New York

The New York State Exchange Clubs will hold a model airplane meet on Sunday, June 12th, at Elmira Airport, Elmira, New York. This meet is sanctioned by the National Aeronautic Association.

Only members of model airplane clubs sponsored by Exchange may participate in the meet. There are no entry fees. Entry blanks must be properly filled out with the information requested and shall be accompanied by Parent's Consent and Release duly executed. All entries shall reach the contest director not later than June 1, 1938. Address: Harry C. Copeland, Contest Director, 721 Chimes Building, Syracuse, N.Y.

Events—Stick Model, hand-launched; Fuselage Model, R.O.G., 10 a.m. to 2 p.m., Standard Time. Gas-Powered Model, 30-second motor run, 2 p.m. to 5 p.m., Standard Time.

Awards: 2 gas motors, 2 trophies, 6 medals, 4 kits, pair air wheels.

Box lunches will be provided for contestants and officials.

## Iowa

Wallace R. Blake, President of the Ace Model Club, sends us a report of this group's activities. The club meets at 321 North Third Street, Marshalltown, Iowa. Mr. Blake says:

"The 1938 Ace Model Club Air Race, to be sponsored by the Marshalltown Junior Chamber of Commerce, will be held Monday, July 4th. This year's meet, which will be the Ace Model Club's third annual meet, is to be an all day affair with two big events. These are the usual rubber powered event, which has been the annual meet in the past two years, and a gas model event, which will be the first statewide gas model meet held by our club. The local Junior Chamber of Commerce also sponsored last year's meet.

## Scheduled Contests For June

**June 4**—The Junior Aviation League will hold indoor events of the New England Championship Model Contest at Boston Garden, Boston, under the direction of Munnick, Lewis and Brown.

**June 4**—The Philadelphia Model Aeroplane Association will hold an outdoor meet at Castor Avenue & Magee Street under the direction of Pierce, Streeter, and Fritz. Rain date: June 11.

**June 5**—The Junior Aviation League will hold the outdoor events of the New England Championship Model Contest at Harvard College Practice Field, Boston, under the direction of the usual trio.

**June 5**—The Jeanerette Aeromuts Junior Chapter will hold their Recreation Center Model Airplane Meet (outdoor only) at Bourgeois Field, Jeanerette, La., under the direction of Tilden J. Robichaux, Jr.

**June 11**—The Quaker City Model Airplane Club will hold their Championship Gas Model Meet at the Northeast Airport, June 11, 10 a.m. to 5 p.m. For blanks, etc., write to Contest Director W. S. Berry, 951 E. Price St., Philadelphia, Pa.

**June 12**—The East Texas N.A.A. Model Meet will be held at the Tyler Airport, Tyler, Texas, under the direction of O. C.

## PROPELLERS

- ANY QUANTITY
- FINEST BALSA
- TRUE PITCH
- 4" to 16" DIAMETER



Manufacturers of model airplane kits as well as model builders, are now assured of an unfailing source of supply for propellers of any size or quantity. Comet's Supply Division is prepared to produce Balsa propellers of absolutely true pitch, cut to the highest precision standards, on short notice. Volume production assures lowest prices. Let us quote you on your needs.

**WRITE on Letterhead for  
FREE SAMPLES and LOW  
PRICES**

## COMET TIMER FOR GAS MODELS!

Amazing new timer. Simple, fool-proof. Adjustable 10 to 50 seconds. Ready to install—each timer complete with directions in attractive carton. Weight 1/8th ounce. Patent pending. Write for further information. Price only..... **50c**

here's the **KNIFE** for you!



## THE PERFECT KNIFE FOR PERFECT WORK!

Blades of finest surgical steel cut through thick Balsa. Can be sharpened or replaced. Knife complete, 10c. Replacement blades, 3 for 10c. At all dealers.

**SUPPLY DIVISION**

## COMET MODEL AIRPLANE and SUPPLY COMPANY

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# BUD WARREN Says:



"I HAVE been fortunate in securing a limited stock of BRAND NEW, latest style 'Tom Thumb' gas engines, which you can buy while they last for . . . \$7.50 Post Paid 'Assembled and block-tested, I guarantee each engine full 1/5 H.P. Complete with fuel tank, coil, spark plug, one-piece cylinder and head and other modern features. Flying wt. 10 oz. (less batteries). You can duplicate the motor performance of my famous airplanes with the Tom Thumb."



## WARREN REBUILT MOTOR EXCHANGE

Send me \$5.50 and your old motor, regardless of its condition, and receive an engine completely rebuilt to new specifications, with all the latest improvements. This exchange service includes complete rebuilt cylinder, new rings, spark plug, band point and insulation, spring points, condenser and gaskets.

The following are replaced with new parts, or rebuilt where needed: main bearing, crankshaft, crankcase, piston, con rod and wrist pin. All bolts and nuts new. Tank and carburetor rebuilt or new. Also new coil where needed.

Bud Warren service is factory authorized, and all replaced parts are genuine. Block-tested and set in first-class running condition, these engines are packed and shipped immediately.

"I service BUNCH engines only."

Any model Bunch engine is eligible for this exchange. You must send all motor parts, including tank, coil and condenser, regardless of condition. If parts of your engine are missing, include the factory list price of missing parts (plus the exchange price, \$5.50).

**WARREN SALES & SERVICE CO.**  
412 Brett Street (Inglewood), Los Angeles, Calif.

☐ Rush me 1 Tom Thumb Engine. I enclose \$7.50.  
☐ I am sending my old engine and \$5.50. Send me a rebuilt motor as described above.

Name.....  
Street.....  
City..... State.....

Palmer. Events are Fuselage C and D, Stick C and D, R.O.W. B, and Scale Models.

June 19—The Junior Chapter at Bloomington, Ill., will hold a gas model contest with duration and pay-load events at the Bloomington Municipal Airport, under the direction of Russell Blakney.

June 25—The Linden Model Aircraft Club will hold a New Jersey State Gas Model Meet at Hadley Field under the direction of Frank M. Krysiak.

## How to Build the 1937 Wakefield Winner

(Continued from page 35)

He tried it first, then Fillon. Mr. Chabot and the rest follow suit. The immediate improvement was evident, especially on Fillon's and Chabot's ships, as the models now had the needed "zoomp" to take them above the stagnant ground air.

On the second flight Fillon's model climbed high and long enough to contact a friendly thermal. He naturally ran and ran until both he and the model were lost to the sight of the airport watchers. Later on a phone call reported the missing model about eighteen miles from the Fairey Air-drome.

We still remember the joyous smiles of the French team when they found that the model clocked eleven minutes. Now, if he would only come back in time for the third trial their chances were good. The rest of us kept plugging away but no one equaled that out-of-sight time. As time slipped by and Fillon did not show up, Mr. Desnoes and one of the English lads hid over to recover the model and pick up Fillon. However, they returned with model alone, and too late for another trial. Later on the flier himself showed up to learn that he won the cup for the French team. I am just wondering how he felt during his search for the model in a strange country, without knowing a word of English.

Undoubtedly, in winning the cup, model building has been given a great impetus in France. It encourages the boys to continue their trend of designing, since it has been successful against the best that other countries had. All will naturally want to be on the 1938 team, but they hope that their trials will determine the best boys, so that they will retain the cup for another year. "She is so pleasing in Paris! The gay Paris! And we hope she will stay a long, long time!" As Mr. Desnoes so ably puts it.

Mr. Desnoes continues.

"And now, all French aero-modelists hope to see their American friends coming to Paris for the 1938 contest, as we consider it to be the real world championship."

Well, this seems to be about all of the model's and Mr. Fillon's history. Now, let's take a look at the model itself. Since it is next to impossible to have its designer give us a detailed account of how he went about in designing and building, we must depend on our own experience to give the highlights.

You will note that he uses the R. A. F. 32 for the wing, and an M. 6 for the stabilizer. Many of us have found this to be an ideal

## NOW—Only \$13.75

Set the Pace, with the

### SYNCO ACE

The Modern, Streamlined Power Plant. Immediate deliveries, with all 1938 improvements.

### NEW SYNCO BEE

Ready by June 20. Smallest! Lightest! Only 1/2" bore and 3/8" stroke. Approx. weight, 4 oz. You've waited for this little engine. Here it is. At your dealer, only \$12.50.

### Syncro Devices, Inc.

523 Boydel Bldg. Detroit, Mich.

## FREE FREE

If we haven't got your name on our list of model airplane fans—we will send you a Surprise Gift of curious interest. Just send a postcard—and you shall have "IT" absolutely FREE!

**HEATHE MODEL AIRPLANE CO.**  
260M Troy Ave. Brooklyn, N. Y.



## FINISHED MODELS

These models are completely finished and attractively mounted on a polished metal pedestal.

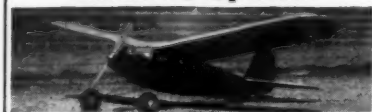
They are built of pattern pine and are lacquered to a satin smooth finish. Wingspans average 7 inches. They are built true to scale and embody many details. The following models are available:

Curtis "XP-37"	Hawker "Hurricane"
Grumman "XF4F-2"	Curtis "Hawk 75"
Seversky "P-35"	Taylor "Cub"
Curtis "P-35"	Curtis "P-36-A"
"Rudy Kling's" Folkert	"Roscoe Turner's" Meteor
Bell "Aircuda"	DeHavilland "Comet"

These all have 7 inch wingspans and are \$2.25 each, postpaid. No C.O.D. orders or stamps please. Also print name and address when ordering.

28 Peach St. **MUELLER BROS.** Buffalo, N. Y.

## Burrows Special



Wing span, 5 1/2". Chord 12". Flying weight 3 3/4 lb.

Boys, get ready for the Nationals! You still have time to build this contest ship. This ship has flown 20 minutes on a forty-second engine run and averaged 2 1/2 minutes on three engine runs of 20 seconds each. The above cut shows one unretouched view of this dependable and consistent flyer. The Special has a flat smooth glide.

Kit consists of cut-out ribs, bulkheads and stamped formers. Plenty of wood, cement, etc., to complete plane. Large full-size plans included.

Kit complete (less motor, timer or air-wheels) ..... \$5.50 plus postage

Kit complete (less motor) with autoknip type timer and 4 1/2" voit air wheels ..... \$7.50 plus postage

**CHARLOTTE MODEL AIRCRAFT CO.**

Professional Bldg. (Basement) Charlotte, North Carolina



arrangement. Evidently Mr. Fillon knows that larger chord airfoils are more effective than small chords, since he kept his chord five inches for quite a length, and yet achieved good aerodynamics by his gradual elliptical tips. The "wee bit" of parasol also helps in getting every bit of lift from the wing, by hardly disturbing the side airflow of the fuselage. The dihedral could have been a bit larger to eliminate any possible chances of too much banking while taking off under full power. (In fact, we can recall this particular trouble during the Exposition contest. But it is not known if more power was used to account for it). Just in case your duplicate has tight bank tendency, just remember that another inch of dihedral should cure it.

The wing mount is typical French design. The bamboo cabane is fixed to the fuselage on wire struts, which determine the incidence, and at the same time make adjustments possible. The writer was a bit skeptical about the rigidity, but its two side struts do the trick in preventing shifting. You will note that the wing is fixed to the bamboo strip with looped rubber. Another peculiarity is the extensive use of reed in keeping wires fixed.

The construction of the wing and tail should present no serious problem. It is just a matter of studying the drawings and making full size outlines. Just be sure to have the dimensions correct. You will have to use your own past experience in selecting the balsa. The total weight table should be your final check.

The fuselage itself is very simple to build. You will note the clean and streamlined sweep. Setting on edge helps considerably in lowering the drag; especially if you remember that the model very seldom travels in a line parallel to the center line of the fuselage.

The part needing most attention is the tail construction. Note how cleverly the stabilizer and rudder are fitted. The tail keel is a hint we might all follow. It is drawn full size so that you should have no trouble in duplicating it. Notice again the use of reed to keep the rudder fixed. It is first inserted in the rear and then the front prongs are pushed into the reed in back of the plug. It seems flimsy but it works well. The rear hook arrangements calls for a piece of plywood. However, hard balsa should do the trick. Just be sure it is hard and cement joints solid and well set.

Next is the nose plug. The plug itself is carved from hard wood, a good idea. Note how simple and effective his rubber tensioner is. Those of us who have tangled up in the prongs, hooks, and springs on the exposed type will appreciate this design. The shown free-wheeling is made in France and it can not be obtained at the moment in America. It is an excellent idea and Mr. Weber should be proud of it. A fair duplicate was suggested by Ed Lidgard of Chicago, who uses bicycle spokes for shaft. He flattens one end of the threaded ferrule and drills a hole for the winder. A standard heavy duty free-wheeler of Garami type should serve the purpose. However, the convenience of removing the prop at will is worth extra trouble.

At the moment of writing it is not known what size of prop was used at the contest, since it was mentioned that it was cut down.

## AGAIN Bay Ridge Scoops the Gas Model Field With THE BAY RIDGE MIKE



Wing Span 48" Length 32" Weight 20 ozs. with engine

The "Mike" is a small gas job especially designed for miniature motors having a bore of  $\frac{1}{8}$ " or less. Its keen lines make a beautiful looking model, just the thing you want for the coming contest.

Kit includes full size plans, printed sheet balsa, cut out ribs, large cans of cement, clear dope, colored dopes,

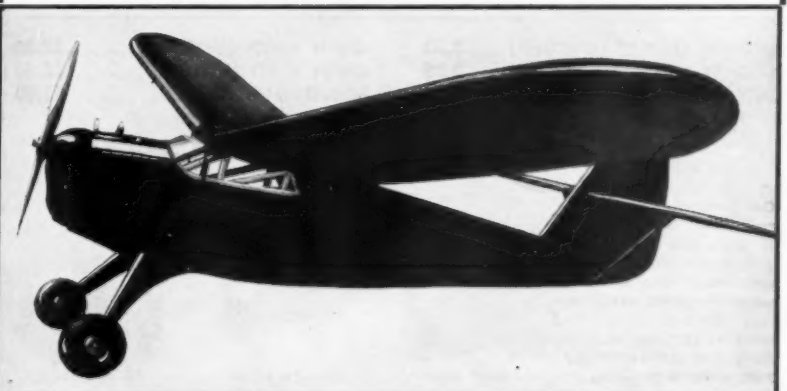
bamboo paper, shaped propeller, wire and many other parts to complete the model.

Complete Standard Kit (Without Airwheels).....\$2.50 P.P.

Deluxe Kit with M & M Airwheels, Silk for covering, and finished propeller.....\$3.50 P.P.

Full Size plans and Instructions......50 P.P.

## THE BAY RIDGE IKE — 6 FT. GAS MODEL



The true actual photo shows you how beautiful the ship looks. It is completely streamlined leaving no parts of the engine exposed. Many new features are found on the plane, such as: needle valve extension, single leg landing gear, raised tail surfaces and inverted engine which also can be mounted upright.

Kit is neatly packed in an attractive box with cut out ribs, shaped propeller, large cans

of cement, dope, wire, aluminum sheet, celluloid, screws, nails, balsa wood strips cut to size and many other parts to complete the model.

Complete Kit (except air wheels).....\$3.95 P.P.

Deluxe Kit with air wheels and colored dope.....6.50 P.P.

Full size plans.....50c P.P.

**SPECIAL OFFER** NEW BROWN JR. MOTOR AND BAY RIDGE IKE KIT FOR..... **\$13.95** C.O.D. Filled

Dealers, jobbers write for special discounts.

## GAS POWERED SUPPLIES—The Best Obtainable

<p>FREE with every order of \$4.00 or over we will give 1 pint of cement and free postage in U.S.A.</p> <p><b>BALSA</b></p> <p>5 Ft. Lengths</p> <p>1/4x1/4 - 4 for .10 1/4x1/2 - 3 for .14 1/4x1 - 2 for .15 3/16x3/16 - 8 for .25 3/16x1/4 - 2 for .10 3/16x1/2 - 2 for .19 1/4x1/4 - 6 for .25 1/4x1 - 3 for .25 3/16x3/16 - 3 for .25 1/4x1 - 1 for .18 1x1 - 1 for .25</p> <p><b>BAMBOO PAPER</b></p> <p>24x36 each .05</p>	<p><b>GAS MODEL Balsa</b></p> <p>20" or 18" length of gas model balsa can be had. See our regular list of model supplies below. Please mention its use.</p> <p><b>SHEET Balsa</b></p> <p>5 Ft. Lengths</p> <p>1/32x2 - 2 for .15 1/16x2 - 2 for .17 3/32x2 - 2 for .20 1/8x2 - 2 for .23 1/4x2 - 2 for .27 1/2x2 - 2 for .35</p> <p>Double the 2" price for 3" width.</p> <p><b>HARD ALUMI-NUM SHEET</b></p> <p>1/16x3x12 - .28 1/32x3x12 - .15</p>	<p><b>COVERING SILK</b></p> <p>1 Yd. 36x36 .45</p> <p><b>AIRCRAFT SPRUCE</b></p> <p>5 Ft. Lengths</p> <p>1x1/4 - 1 for .04 1x1/2 - 1 for .05 3/16x3/16 - 1 for .07 3/16x1/4 - 1 for .10 3/16x1/2 - 1 for .15 3/16x3/16 - 1 for .40 1x1/4 - 1 for .09 1x1/2 - 1 for .14 1x1 - 1 for .17 1x3/4 - 1 for .45</p> <p><b>HARD ALUMI-NUM ANGLE</b></p> <p>1/2x1/2 per ft. .15</p> <p><b>M &amp; M AIR WHEELS</b></p> <p>3/16" pr.....\$1.50 3/8" pr.....2.50 4 1/2" pr.....3.75</p>	<p><b>OHLSOON AIR WHEELS</b></p> <p>3 1/2" pr.....\$1.50 4 1/2" pr.....1.75</p> <p><b>Gas Model Cement</b></p> <p>Clear Dope</p> <p>Colored Dope and Thinner</p> <p>1 1/2 pint can. .35 1 pint can.....60</p> <p><b>GAS MODEL PROPS</b></p> <p>12" ..... .65 13" ..... .75 14" ..... .75 15" ..... .75 16" ..... \$1.00</p> <p><b>MODEL AERO-NAUTICS YEAR BOOK</b></p> <p>This book contains more than 20 detail plans of both gas and rubber powered models. Price \$1.00 P.P.</p>	<p><b>ALUMINUM RIVETS</b></p> <p>1/4" dia. doz. .05</p> <p><b>STEEL MUSIC WIRE</b></p> <p>5 Ft. Lengths</p> <p>1/16 dia. .... .10 3/32 dia. .... .15 1/8 dia. .... .25</p> <p><b>SHEET CELLULOID</b></p> <p>\$2.00 each..... .07</p> <p><b>REED</b></p> <p>1/4" dia. ft. .... .03 1/2" dia. ft. .... .02</p> <p><b>WIDGET FIRE-CRACKER COIL</b></p> <p>Suitable for any type of engine. Vt. 2 oz. Each \$2.50 P.P.</p> <p><b>GAS MODEL TIES</b></p> <p>Easy to install can be regulated from 1 to 45 seconds. Each \$1.75 P.P.</p>	<p><b>Ordering Instructions</b></p> <p>Add 15c packing charge on orders for less than \$1.50 in U.S.A.</p> <p>All orders over \$1.50 send post-paid. Minimum order for 5 Ft. lengths is \$1.00.</p> <p>Canadian charges 25c extra. 5 Ft. lengths send express charges collect to Canada.</p>
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**BAY RIDGE MODEL AIRPLANE & SUPPLY CO.**  
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Brooklyn, N. Y.



## IF IT'S GAS MOTORS YOU WANT, SEE WHAT YOUR MONEY WILL BUY FROM BURD!

### BUY A BROWN JR. MOTOR

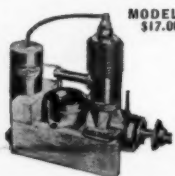
IT'S MADE TO TAKE  
IT AND GIVE YOU LAST-  
ING SATISFACTION!



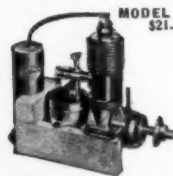
MODEL D  
\$10.00



MODEL M  
\$15.00



MODEL C  
\$17.00



MODEL B  
\$21.50

A PROPELLER, BURGESS BATTERY, SAE 70 OIL AND A MOTOR  
MANUAL—TOTAL VALUE \$2.50—for . . . only **25c**

IMMEDIATE SHIPMENT FROM STOCK IS ABSOLUTELY GUARANTEED!

## FREE PROPELLER, OIL AND BATTERIES

WITH ANY OF THE MOTORS LISTED BELOW; ALL READY TO RUN

MIGHTY MIDGET (UPRIGHT)..... **9.50**  
MIGHTY MIDGET (INVERTED)..... **9.75**  
INTERMOTE (WATER COOLED)..... **16.50**  
SYNCO-ACE ..... **13.75**

GWIN AERO (UPRIGHT)..... **12.00**  
GWIN AERO (INVERTED)..... **12.50**  
MIGHTY MARINE ..... **12.50**

These motors will fly models as small as 30" and up to 60"

Get down to a size you can really work with. For rapid dependable service get your motor from BURD—the house that gives a complete outfit, ready to run. We maintain a large stock at all times and are ready to ship the same day your order is received.



BRAT \$16.50



CONDOR \$16.50



TROJAN \$16.50

**BURD MODEL AIRPLANE CO. 101-105 W. PRATT ST. BALTIMORE, MD.**

On chance thought, it looks as though the original block size is given on the drawings and the winning prop was cut down to 18 inches. If information is received in time it will be noted under one of the photos.

The flying adjustments were about 3/32" down thrust and a bit of side thrust for right turn. The adjustments were added during the tests after the model was built. You can do likewise, or incorporate them in the plug or nose.

This about completes the job. We regret that we will be unable to answer any questions since we tried our best to have data exact as our translation permitted. Correspondence addressed to Fillon himself would not help since he is not at home and will be away for quite a while. Some might wonder why celluloid wheels are used since rules definitely specified all parts must be made by the builders. It seems a common practice in France to use commercial wheels. And since a French translation of the Wakefield rules do not specifically mention home-made wheels, the practice

was carried over. And since they are of minor importance, it would be rather small for any one to carry this as an infraction of the rules. But it should not be used as an excuse by you to use commercial wheels for your models.

### Official Results of Paris Exposition Contest

Rules: Formula as used by Official French Technical service for large planes; gr. Grammes

$$\text{Points} = C\sqrt{Tq}$$

		Duration
1	Vincere	406.2s
2	Zaic	235.4
3	Dague	217.8
4	Germain	202.2
5	Fish	221.8
6	*Dague	193
7	Fillon	188
8	Bodle	156
9	Weber	206.2
10	Degler	242.6
11	Desnoes	144.4

\*Dague entered two ships—Note what a difference the formula makes in the winning time. Normally I would be third but the heavy job brought me up pretty close to winning points.

## CLASSIFIED DIRECTORY

Advertise in this directory for quick profitable results! Rate 10c per word. Minimum 20 words. REMITTANCES MUST ACCOMPANY ALL ADS FOR THIS DIRECTORY. Advertisements for the August issue must be in by June 10.

### MODEL AIRPLANES—KITS—SUPPLIES

**GASOLINE** powered model airplane kits, new and rebuilt motors and supplies. Free list. Carl A. K. Eldredge, Jr., Haddonfield, N.J.

**GAS MODEL** Propeller Blanks correctly drilled, outlined, tapered, 12" to 16" 30c p.p. Four for \$1.00. Joseph Rausand, 83 Walnut St., Waterbury, Conn.

**DEALERS, Clubs, Schools:** Send for low, complete wholesale list, including gas model supplies. Save money. Model Airplane Utility, 5307 New Utrecht Ave., Brooklyn, N.Y.

**BROWN AERO RUBBER**—Hodgman Rubber Company, 261 Fifth Avenue, New York City. Chicago office: 412 South Wells Street. Dealers and manufacturers only.

**SAVINGS** on model airplane supplies. Write for free price list. Dealers, Clubs. Our discounts mean real profits. Waterbury Model Builders Supply, 131 Cherry Street, Waterbury, Connecticut.

**GLIDER** kit with ready-cut to shape wings and tail, wood for body, glue, wood-filler, clay, sandpaper, instructions, and plans—45c postpaid. The Model Airplane Shop, 120 Broadway, San Antonio, Texas.

**GAS MODEL** Propellers—5 ply laminated, aerodynamically true, beautifully carved, high gloss finish, 12" to 16", State type engine, \$1.00 each postpaid. Ace Propeller Works, 306 Bradford St., Brooklyn, N.Y.

**NEW!** PeeWee scale gas job of Cessna Airmaster. Complete dry kit, M & M wheels. \$4.50. Wells, 5734 Merriwood Dr., Oakland, Calif.

**MEGOW'S 30"** Monocoupe, Stinson, Arrow Sport, Aerona, Waterman, Fairley Battle—50c each postpaid, with one 20" Guillow's dry kit free. Megow's and Guillow's 12", 15", 16", 20" Flying Models, 2 for 35c, 6 for \$1.00 postpaid. G. L. Young, 2404 Second Ave. No., Birmingham, Alabama.

**CANADA'S** largest Model Aircraft Supply House. Gas Motors, Kits, etc. Write for Illustrated Price List. Ontario Model Aircraft, Toronto, Ontario.

**GAS MODEL** Specialties, 314 Second North, Syracuse, N.Y.—New Catalogue, more sensational than ever. Send to-day for your free copy. Special—Two Minute Timer (regularly \$3.00) only \$2.25 p.p.

**SEND** ten cents in silver for the guiding light for the beginner "Ham" (Radio Amateur Operator). R. Huenger, Box 141, Islip Terrace, N.Y.

**SLEEK** new realistic designs. Light, durable construction—consistent fliers. 36" wingspan low wing racer, high wing Sportplane, or Cabin. Complete kits, including free-wheeling propeller, 60c each. Mars Models, 600 No. Solano, Albuquerque, N.M.

**SOUTHERNERS**—Do you want it quick? We send orders the day we receive them. We carry all of the popular motors, kits and supplies. Send 3c stamp for our latest catalogue. The Model Airplane Shop, 120 Broadway, San Antonio, Texas.

**DEALERS** Wanted—Attractive 2 ounce tube nitrate cement, retails 10c. Send for price list. Model Airplane Accessories, The Model Shop, 1929 Broadway, Denver, Colorado.

**MOTORS** checked and adjusted \$1.00. Largest assortment of gas models and supplies all motors in stock. Scale Models and boats. Long Island Hobby Shop, 135 A Main Street, Hempstead, L. I.

We wonder how we managed to finally finish this article since it has so many pleasant memories for us which induce day dreaming. Although they say you should see America first, you will always remember a trip across the pond. So consider yourself especially fortunate if you make the voyage in 1938 to Paris to bring the cup back where it belongs, here in the United States! However, may the best nation win as it is the purpose of the cup to bring nations together in friendly rivalry.



# FLY over land, sea or ice!!

## With Wheels

A short run . . . the tail is up . . . she's off! A fast, powerful climb taking her up into the thermals; a flat, leveling glide when power is out. It's the Skeeter providing the thrill sensation of the year! The newest in flying beauty by "BURD" designers. The same craftsmen who with their smash hits on the Thermalider and World Record Holder are daily bringing in reports such as these—"A three minute flight after power was out" . . . "Six minutes on our stop watch before she went out of sight". BURD MODELS ARE OUTSTANDING IN FLYING PERFORMANCE! You'll want one of these to "bring home the bacon" for you at the contests. Get it NOW!

EQUIPPED WITH INTERCHANGEABLE LANDING GEAR!

THE TERRIFIC, SENSATIONAL

**SKEETER**

A GENUINE FLYING BEAUTY  
ABSOLUTELY COMPLETE IN EVERY RESPECT!



36" WINGSPAN  
28 1/2" LENGTH

ONLY  
\$1.00

COMPLETE  
POSTPAID  
OR AT YOUR  
DEALER

## With Floats

It's ideal flying weather! Warm, balmy days, clear skies, rising air currents. What thrills could be yours while relaxing at your summer home if only you had a model with floats! Well fellows—here's the swellest flying creation that has ever been made—and . . . it's equipped with floats. Long, sleek and buoyant, your model rests on the rippling surface of the water. Look at her skim along and shoot up like a graceful, soaring bird. Wouldn't you like to be her proud owner? Get a squint at the price! It's within your reach and worth easily four times as much. You had better get yours FAST while the supply lasts.

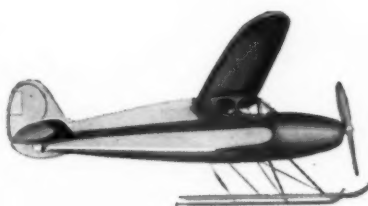
GET YOURS NOW!!



## With Skis

This rugged, giant flying model is built to take it! When summer is gone, snap off the floats, change to skis, and you have a flying fool ready to battle the icy blasts for altitude. Yes, we know it's a long way off, but let's be far sighted in picking this one. You have probably been disappointed many times before but here is a model adaptable to any need. It's big (36" wing span), strong (and can really take it), and an endurance flyer that's a prize winner everywhere. Simple as ABC to build, equipped with interchangeable wheels, floats and skis, made to fly in any weather. It has been built for you. HURRY, get it AT ONCE!

A REAL BUY!!



### SOME ADDITIONS YOU MAY LIKE

Inflatable M & M wheels, per pair .50. This model performs best on a GOOD grade of FRESH BROWN RUBBER. A band is furnished in the kit. For extra good flying results get some of our SPECIAL STOCK, now 50 ft. .40. A saw cut prop is furnished in the set but you might like to carve your own. Get a ready shaped blank, especially selected, only .30. If you expect to fly a lot in water you may prefer an extra special dope job and may require additional dope. We stock fine quality clear and colored dope, 2 oz. .15, 1/2 pt. .40, 1 pt. .75.

### DEALERS!

Remember the grand, enthusiastic receptions given our Thermalider and Korda's World Record Holder (still selling big at 50c and \$1.00 respectively)? Well, this model will have even more appeal and the demand will be terrific! It really is a colossal value so take a tip—GET AN ADEQUATE STOCK AT ONCE! DON'T DELAY—it cost's you profits. If you are not at present a dealer, write or wire for our proposition.

**BURD MODEL AIRPLANE CO., 101-105 W. Pratt St., Baltimore, Md.**

In England: Elite Model Plane Co., 14 Bury New Rd., Manchester  
In Sweden: Sven Wentzel, 54 Apelbergsgaten, Stockholm

In Australia: K Dee Mfg., Ltd., 113b Bathurst, Sydney  
In South Africa: Model Aircraft (Pty.), Ltd., 23 Dock Rd., Capetown

### BURD GIVES YOU

#### PROPELLERS!!

Really designed to carry your model to best advantage and get the most out of your motor. In ordering specify what type motor you have. All props finely finished in hard wood. 9", 10 1/4", and 12" diam. ea. .75  
13" and 14" diam. ea. 1.00

**Bamboo Parchment Covering**  
White sheet .08  
Red or yellow sheet .10  
Genuine Fine Silk Per sq. yard. .60

**Dural Angle Beams**  
1/2" x 1/4" per ft. .20  
**Spring Steel Wire**  
1/16 diam. x 36" .08

**Selected Balsa or Aircraft Spruce**  
(5 ft. lengths in strips)  
3/16 x 1/4" .06  
1/2 x 1/4" .08  
3/8 x 1/4" .10  
1/2 x 1/2" .12  
3/4 x 1/2" .14  
1" x 1/2" .16  
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179 1/2" x 1/2 .ea. 7.34  
180" x 1/2 .ea. 7.36  
180 1/2" x 1/2 .ea. 7.38  
181" x 1/2 .ea. 7.40  
181 1/2" x 1/2 .ea. 7.42  
182" x 1/2 .ea. 7.44  
182 1/2" x 1/2 .ea. 7.46  
183" x 1/2 .ea. 7.48  
183 1/2" x 1/2 .ea. 7.50  
184" x 1/2 .ea. 7.52  
184 1/2" x 1/2 .ea. 7.54  
185" x 1/2 .ea. 7.56  
185 1/2" x 1/2 .ea. 7.58  
186" x 1/2 .ea. 7.60  
186 1/2" x 1/2 .ea. 7.62  
187" x 1/2 .ea. 7.64  
187 1/2" x 1/2 .ea. 7.66  
188" x 1/2 .ea. 7.68  
188 1/2" x 1/2 .ea. 7.70  
189" x 1/2 .ea. 7.72  
189 1/2" x 1/2 .ea. 7.74  
190" x 1/2 .ea. 7.76  
190 1/2" x 1/2 .ea. 7.78  
191" x 1/2 .ea. 7.80  
191 1/2" x 1/2 .ea. 7.82  
192" x 1/2 .ea. 7.84  
192 1/2" x 1/2 .ea. 7.86  
193" x 1/2 .ea. 7.88  
193 1/2" x 1/2 .ea. 7.90  
194" x 1/2 .ea. 7.92  
194 1/2" x 1/2 .ea. 7.94  
195" x 1/2 .ea. 7.96  
195 1/2" x 1/2 .ea. 7.98  
196" x 1/2 .ea. 8.00  
196 1/2" x 1/2 .ea. 8.02  
197" x 1/2 .ea. 8.04  
197 1/2" x 1/2 .ea. 8.06  
198" x 1/2 .ea. 8.08  
198 1/2" x 1/2 .ea. 8.10  
199" x 1/2 .ea. 8.12  
199 1/2" x 1/2 .ea. 8.14  
200" x 1/2 .ea. 8.16  
200 1/2" x 1/2 .ea. 8.18  
201" x 1/2 .ea. 8.20  
201 1/2" x 1/2 .ea. 8.22  
202" x 1/2 .ea. 8.24  
202 1/2" x 1/2 .ea. 8.26  
203" x 1/2 .ea. 8.28  
203 1/2" x 1/2 .ea. 8.30  
204" x 1/2 .ea. 8.32  
204 1/2" x 1/2 .ea. 8







**Cleveland Model & Supply Co., Inc.**  
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Spain 20% Sug. Col. :  
Club-sug. for 24 hour shipment  
D77 K11 D-24 \$1.20  
D77 K11 D-24 \$1.20  
D77 K11 D-24 \$1.20

those which have a "transit charge" then add  
for our attention  
Catching if you don't have a song.

yellow. O'rab (or blue)  
K11 D-24 \$1.20  
K11 D-24 \$1.20